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MATSUMOTO METRICS OF REVERSIBLE CURVATURE

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Abstract. In this paper, we study the reversibility of Riemann curvature and Ricci curvature for the Matsumoto metric and prove three global results. First, we prove that a Matsumoto metric is R-reversible if and only if it is R-quadratic. Then we show that a Matsumoto metric is Ricci-reversible if and only if it is Ricci-quadratic. Finally, we prove that every weakly Einstein Matsumoto metric is Ricci-reversible.

1. Introduction

The class of (α, β)-metrics was introduced by Matsumoto as extension of Randers and Kropina metrics [9]. An (α, β)-metric is a Finsler metric on M defined by $F := \alpha\phi(s)$, where $s = \beta/\alpha$, $\phi = \phi(s)$ is a C^∞ function on the $(-b_0, b_0)$ with certain regularity, α is a Riemannian metric and β is a 1-form on M [3, 14, 15].

Recently, Crampin proved that a Randers metric $F = \alpha + \beta$ has reversible geodesics if and only if β is parallel with respect to α [2]. Then Masca-Sabau-Shimada investigate (α, β)-metrics with reversible geodesics and projectively reversible geodesics [6, 7]. In general, the Finsler metrics might not be reversible. In spite of the non-reversibility of Finsler metrics, the geodesics and curvatures might be reversible.

In [11], Shen-Yang introduced the notions of R-reversibility and Ricci-reversibility. They proved that Randers metrics are R-reversible or Ricci-reversible if and only if they are R-quadratic or Ricci-quadratic, respectively. In this paper, we are going to study the reversibility of Riemann curvature and Ricci curvature for a Matsumoto metric $F = \alpha^2/(\alpha - \beta)$ which is called by Matsumoto's slope-of-a-mountain metric, also. This metric was introduced by Matsumoto as a realization of Finsler's idea "a slope measure of a mountain with respect to a time measure" [12, 13]. He gave an exact formulation of a Finsler surface to measure the time on the slope of a hill and introduced the Matsumoto metrics in [8, 15].

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The Riemann curvature $\mathbf{R}_y\colon T_xM \to T_xM$ is a family of linear maps on tangent spaces. A Finsler metric F on a manifold M is said to be R-quadratic if its Riemann curvature $\mathbf{R}_y$ is quadratic in $y \in T_xM$ [5][11]. The notion of R-quadratic metric was introduced by Shen [10]. F is called R-reversible if $\mathbf{R}_y = \mathbf{R}_{-y}$ (see [11]). A Finsler metric F is called Ricci-quadratic if its Ricci curvature Ric_y, is quadratic in $y \in T_xM$. F is called Ricci-reversible if $\mathrm{Ric}_y = \mathrm{Ric}_{-y}$ (see [11]). In this paper, we have the two following theorems.

Theorem 1.1. *A Matsumoto metric is* Ricci-*reversible if and only if it is* Ricci-*quadratic.*

Theorem 1.2. *A Matsumoto metric is R-reversible if and only if it is R-quadratic.*

A Finsler metric on an n-dimensional manifold M is said to be of weakly Einsteinian if the Ricci curvature be in the form $\mathbf{Ric} = (n-1)[3\theta F + \sigma F^2]$, where $\theta = \theta_i(x)y^i$ is a 1-form and $\sigma = \sigma(x)$ is a scalar function on M.

Theorem 1.3. *Every weakly Einstein Matsumoto metric is Ricci reversible.*

2. Preliminaries

An important class of Finsler metrics is so called (α, β)-metrics, which are expressed in the form of $F = \alpha\phi(s)$, $s = \beta/\alpha$ where $\alpha = \sqrt{a_{ij}(x)y^iy^j}$ is a Riemannian metric and $\beta = b_i(x)y^i$ is a 1-form. Put

$$r_{ij} := \frac{1}{2}(b_{i|j} + b_{j|i}), \quad s_{ij} := \frac{1}{2}(b_{i|j} - b_{j|i}), \tag{1}$$

where $'|'$ denotes the covariant derivative with respect to the Levi-Civita connection of α. Let

$$r^i_j := a^{im}r_{mj}, \quad s^i_j := a^{im}s_{mj}, \quad r_j := b^m r_{mj}, \quad s_j := b^m s_{mj}, \quad r := b^i r_i,$$

where $a^{ij} := (a_{ij})^{-1}$, $b^i := a^{ij}b_j$. We the subscript 0 means the contraction by y^i. Let G^i and $\bar{G}^i$ be the geodesic coefficients of F and α respectively. Then we have the following

Lemma 2.1 ([4])**.** *Let $G^i = G^i(x,y)$ and $\bar{G}^i_\alpha = \bar{G}^i_\alpha(x,y)$ denote the coefficients of F and α respectively in the same coordinate system. Then, we have*

$$G^i = \bar{G}^i + \alpha Q {s^i}_0 + \Psi(r_{00} - 2\alpha Q s_0)b^i + \frac{1}{\alpha}\Theta(r_{00} - 2\alpha Q s_0)y^i, \tag{2}$$

where

$$Q := \frac{\phi'}{\phi - s\phi'}, \ \Psi := \frac{\phi''}{2[\phi - s\phi' + (b^2 - s^2)\phi'']}, \ \Theta := \frac{\phi\phi' - s(\phi\phi'' + \phi'^2}{2\phi[\phi - s\phi' + (b^2 - s^2)\phi'']}.$$

For a Matsumoto metric $F = \frac{\alpha^2}{\alpha - \beta}$ and by a quite long computational procedure using Maple program, we obtain the following (see Proposition 3.1 in [1]).

Lemma 2.2. *Let $F = \alpha^2/(\alpha - \beta)$ be a Matsumoto metric on a manifold M. Then the Riemannian curvature of F is given by*

$$R^i{}_j = \left(\frac{1}{4\alpha^4(\alpha - 3\beta + 2b^2\alpha)^4(\alpha - 2\beta)^3}\right)\sum_{k=0}^{13} t_k\alpha^k, \tag{3}$$

where $\bar{R}^i{}_j$ is the Riemannian curvature of α and $t_k, k = 0, 1, \ldots, 13$ are as follows

$$\begin{cases} t_0 := 2880y^iy_jr_{00}^2\beta^7, \\ \quad\vdots \\ t_{13} := 4(2b^2+1)^3(-2s^i_ks^k_jb^2 - s^i_ks^k_j - 2s^is_j + 2b^is_ms^m_j) \end{cases}$$

All the coefficients of t_i are tedious, listed in Appendix 1.

By [1], we have the following.

Lemma 2.3. *The Ricci curvature of Matsumoto metric $F = \alpha^2/(\alpha - \beta)$ is given by*

$$\mathrm{Ric} = \left(\frac{1}{4\alpha^2(\alpha - 3\beta + 2b^2\alpha)^4(\alpha - 2\beta)^3}\right)\sum_{k=0}^{11} d_k\alpha^k \tag{4}$$

where $\overline{\mathrm{Ric}} := \bar{R}^m_m$ and and $d_k, k = 0, 1, \ldots, 11$ are as follows

$$\begin{cases} d_0 := -288r_{00}^2(8n-11)\beta^7. \\ \quad\vdots \\ d_{11} := -4(1+2b^2)^3(2s^i_ms^m_ib^2 + s^i_ms^m_i + 4s_ms^m) \end{cases}$$

All the coefficients of d_i are tedious, listed in Appendix 2.

3. Proof of Theorem 1.1

Proof of Theorem 1.1. Let the Ricci curvature of F be reversible, i.e., $\mathrm{Ric}(y) = \mathrm{Ric}(-y)$. Then by contracting both sides of (4) with $4\alpha^2(\alpha - 3\beta + 2b^2\alpha)^4(\alpha - 2\beta)^3$ and by a quite long computational procedure using Maple program, we obtain

$$\sum_{i=0}^{5} d'_{2i}\alpha^{2i} = 0, \tag{5}$$

where

$$d'_0 := 288(8n-11)\beta^7r_{00}^2.$$

All the coefficients of d'_{2i} are listed in Appendix 3. From (5), we know that α^2 divides d'_0. Since α^2 is an irreducible polynomial in y, it must be the case that α^2 divides r_{00}. Thus we have

$$r_{00} = c\alpha^2$$

for some function $c = c(x)$, i.e., β is a conformal form with respect to α. So it is easy to get the following

$$r_{00} = c\alpha^2,\ r_{0j} = cy_j,\ r_i = cb_i,\ r = cb^2,\ r^i_j = c\delta^i_j,$$
$$r_{0k}s^k{}_0 = 0,\ r_{0k}s^k = cs_0,\ s^k{}_0 r_k = cs_0,\ r_{00|0} = c_0\alpha^2. \tag{6}$$

Plugging above equations into (5) imply that

$$d''_0 + d''_2\alpha^2 + \cdots + d''_8\alpha^8 = 0, \tag{7}$$

where

$$d''_0 := -2592(\mathrm{Ric} - \overline{\mathrm{Ric}})\beta^7$$

and other coefficients of d''_i are listed in Appendix 4. By (7), we get

$$d''_0 = k\alpha^2$$

where $k = k(x)$ is a scalar function on M. So we have

$$\mathrm{Ric} = \overline{\mathrm{Ric}} - k\alpha^2.$$

This shows that F is Ricci-quadratic.

Conversely, assume that the Ricci curvature of F is quadratic. Then by (4) we have

$$d'_0 + d'_2\alpha^2 + \cdots + d'_{10}\alpha^{10} = 0,$$
$$d'_1 + d'_3\alpha^2 + \cdots + d'_{11}\alpha^{10} = 0, \tag{8}$$

where d'_{2i} are the same as Ricci-reversibility (since we only use coefficients of d'_{2i}, then we relinquish the coefficients of d'_{2i+1}). Since (8) is the same as (5), by the same method we get

$$\mathrm{Ric} = \overline{\mathrm{Ric}} - k\alpha^2$$

which shows that F is Ricci-reversible. □

4. Proof of Theorem 1.2

Proof of Theorem 1.2. Let F be R-reversible, $\mathbf{R}(y) = \mathbf{R}(-y)$. Then by contracting both side (3) in $4\alpha^4(\alpha - 3\beta + 2b^2\alpha)^4(\alpha - 2\beta)^3$ and using (6) and by a quite long computational procedure using Maple program, we obtain

$$\sum_{i=0}^{6} t'_{2i}\alpha^{2i} = 0, \tag{9}$$

where

$$\begin{aligned} t'_0 : = & -288[10y^iy_jc^2\beta^2 + 12y^iy_jcs_0\beta + 17y^iy_jc_0\beta + 16y^iy_jc_0b^2\beta - 16y^iy_jc^2\beta^2 \\ & +4y^iy_jc^2\beta^2) + 32y^iy_js_0^2b - 20y^iy_jcs_0\beta - 8y^iy_js_{0|0}b^2 - 6y^iy_js_0^2 \\ & -10y^iy_js_{0|0} - 4y^icy_js_0\beta - 8y^icy_jc\beta^2 - 24y^ic_0y_jb^2\beta - 24s^i_{0|0}y_jb^2\beta \\ & +9(R^i_j - \overline{R}^i_j)\beta^2 - 2979s^i_0s_{0j}\beta^2 - 33y^ic_0y_j\beta - 60s^i_{0|0}y_j\beta + 32y^iy_jcs_0b\beta \\ & +32y^icy_js_0b\beta + 32y^ic^2y_jb\beta^2]\beta^5 \end{aligned}$$

and other coefficients of t'_i are listed in Appendix 5. By (9), it follows that α^2 divides t'_0, which is impossible. Therefore

$$t'_0 = 0$$

and we have

$$\begin{aligned} R^i{}_j := \overline{R}^i{}_j - \frac{1}{9}\big[&10y^iy_jc^2 - 16y^iy_jc^2 + 4y^iy_jc^2 - 8y^iy_jc^2 - 2979s^i_0s_{0j} + 32y^ic^2y_jb \\ &+\frac{1}{\beta}(12y^iy_jcs_0 + 17y^iy_jc_0 + 16y^iy_jc_0b^2 - 20y^iy_jcs_0 - 4y^icy_js_0 \\ &-24y^ic_0y_jb^2 - 24s^i_{0|0}y_jb^2 + 32y^iy_jcs_0b - 33y^ic_0y_j - 60s^i_{0|0}y_j + 32y^icy_js_0b) \\ &+\frac{1}{\beta^2}(32y^iy_js_0^2b - 8y^iy_js_{0|0}b^2 - 6y^iy_js_0^2 - 10y^iy_js_{0|0})\big]. \end{aligned} \tag{10}$$

This means that F is R-quadratic.

Conversely, let F be R-quadratic. Then by the same method we have

$$t'_0 + \cdots + t'_{12}\alpha^{10} = 0, \tag{11}$$

$$t'_1 + \cdots + t'_{13}\alpha^{12} = 0, \tag{12}$$

where coefficients of t'_i are listed in Appendix 5. (since we only use coefficients of t'_{2i}, then we relinquish the coefficients of t'_{2i+1}). By (11), we get (10) which proves that F is R-reversible. □

5. Proof of Theorem 1.3

Proof of Theorem 1.3. Let F be weakly Einstein

$$\mathbf{Ric} = (n-1)\big[3\theta F + \sigma F^2\big]. \tag{13}$$

By substituting (4) in (13) and with a long computational procedure, using Maple program, we get

$$\frac{1}{4\alpha^2(\alpha - 3\beta + 2b^2\alpha)^4(\alpha - 2\beta)^3(\alpha - \beta)^2}\sum_{k=0}^{13} A_k\alpha^k = 0, \tag{14}$$

where

$$A_0 := -288\beta^9 r_{00}^2(8n - 11),$$

and other coefficients of A_i are listed in Appendix 6. (14) is equivalent to the following equations

$$\begin{aligned} A_0 + A_2\alpha^2 + \cdots + A_{12}\alpha^{12} = 0, \\ A_1 + A_3\alpha^2 + \cdots + A_{13}\alpha^{12} = 0. \end{aligned} \tag{15}$$

By (15), it follows that α^2 divides A_0. Since α^2 is an irreducible polynomial in y, it must be the case that α^2 divides r_{00}. Thus

$$r_{00} = c\alpha^2$$

for some function $c = c(x)$, i.e., β is a conformal form with respect to α. So it is easy to get

$$r_{00} = c\alpha^2,\ r_{0j} = cy_j,\ r_i = cb_i,\ r = cb^2,\ r^i{}_j = c\delta^i_j,$$
$$r_{0k}s^k{}_0 = 0,\ r_{0k}s^k = cs_0,\ s^k{}_0 r_k = cs_0,\ r_{00|0} = c_0\alpha^2.$$

Plugging the above equations into (15) yields

$$\frac{1}{4\alpha^2(\alpha-3\beta+2b^2\alpha)^4(\alpha-2\beta)^3(\alpha-\beta)^2}\sum_{k=0}^{5} A'_{2k}\alpha^{2k} = 0, \tag{16}$$

where

$$A'_0 := 2592\beta^9\big[\,\mathrm{Ric} - \overline{\mathrm{Ric}}\big]$$

and other coefficients of A'_{2i} are listed in Appendix 7.

By (16), it follows that α^2 must divide A'_0. So we have

$$\mathrm{Ric} = \overline{\mathrm{Ric}} - k\alpha^2,$$

where $k = k(x)$ is a scalar function on M. Therefore, F is Ricci-reversible. $\square$

6. Appendix 1: Coefficients in (3)

$$
\begin{aligned}
t_0 :=\ & 2880y^iy_jr_{00}^2\beta^7,\\
t_1 :=\ & -192y^iy_j\beta^6(9r_{00|0}\beta + 28r_{00}^2b^2 + 35r_{00}^2)\\
t_2 :=\ & 48\beta^5(24y^ir_{j0}r_{00}\beta^2 - 48\delta^i_jr_{00}^2\beta^2 + 18b^iy_jr_{00}^2\beta + 72y^iy_jr_{00}s_0\beta\\
& +102y^iy_jr_{00|0}\beta - 72y^iy_jr_{00}r_0\beta - 36y^ib_jr_{00}^2\beta + 96y^iy_jr_{00|0}b^2\beta + 131y^iy_jr_{00}^2\\
& +64y^iy_jr_{00}^2b^4 + 222y^iy_jr_{00}^2b^2)
\end{aligned}
$$

$$
\begin{aligned}
t_3 :=\ & -48\beta^4\big[154y^iy_jr_{00}s_0\beta - 170y^iy_jr_{00}r_0\beta + 230y^iy_jr_{00|0}b^2\beta + 80y^iy_jr_{00|0}b^4\beta\\
& -48y^ib_jr_{00}^2b^2\beta + 122y^iy_jr_{00|0}\beta + 144y^iy_jr_{0m}s_0^m\beta^2 - 36y^iy_js_{0|0}\beta^2\\
& +21b^iy_jr_{00}^2\beta + 18b^iy_jr_{00|0}\beta^2 - 84y^ib_jr_{00}^2\beta - 80\delta^i_jr_{00}^2b^2\beta^2 + 68y^ir_{j0}r_{00}\beta^2\\
& -54y^is_jr_{00}\beta^2 - 112y^iy_jr_{00}r_0b^2\beta - 128y^iy_jr_{00}s_0b^3\beta + 128y^iy_jr_{00}s_0b^2\beta\\
& -40y^iy_jr_{00}s_0b\beta - 40y^iy_jr_{00}r_0b\beta - 128y^iy_jr_{00}r_0b^3\beta + 72y^ir_{00|j}\beta^3\\
& -72y^ir_{j0|0}\beta^3 - 54s^i_{0|0}y_j\beta^3 - 124\delta^i_jr_{00}^2\beta^2 - 36\delta^i_jr_{00|0}\beta^3 + 24b^iy_jr_{00}^2b^2\beta\\
& +16y^ir_{j0}r_{00}b^2\beta^2 + 18r^i_0y_jr_{00}\beta^2 + 63y^iy_jr_{00}^2 + 120y^iy_jr_{00}^2b^4 + 183y^iy_jr_{00}^2b^2\big]
\end{aligned}
$$

$$
\begin{aligned}
t_4 :=\ & 4\beta^3(1152\delta^i_jr_{00}s_0b\beta^3 + 1152\delta^i_jr_{00}r_0b\beta^3 + 1270y^iy_jr_{00}s_0\beta - 1964y^iy_jr_{00}r_0\beta\\
& +2700y^iy_jr_{00|0}b^2\beta + 1920y^iy_jr_{00|0}b^4\beta + 2304y^iy_js_0^2b\beta^2 - 1440y^iy_jr_0s_0\beta^2\\
& +4032y^iy_jr_{0m}s_0^mb^2\beta^2 - 576y^iy_js_{0|0}b^2\beta^2 - 384y^ib_jr_{00}^2b^4\beta - 648y^ib_jr_{00}^2b^2\beta\\
& -720y^ib_jr_{00}s_0\beta^2 + 288y^ib_jr_{00}r_0\beta^2 - 288y^ib_jr_{00|0}b^2\beta^2 - 864y^is_jr_{00}b^2\beta^2\\
& +956y^iy_jr_{00|0}\beta - 432y^iy_js_0^2\beta^2 + 3744y^iy_jr_{0m}s_0^m\beta^2 - 720y^iy_js_{0|0}\beta^2\\
& +54b^iy_jr_{00}^2\beta + 468b^iy_jr_{00|0}\beta^2 - 72b^ib_jr_{00}^2\beta^2 - 894y^ib_jr_{00}^2\beta - 36y^ib_jr_{00|0}\beta^2\\
& +576y^ir_jr_{00}\beta^3 + 720y^is_jr_{00}\beta^3 - 384\delta^i_jr_{00}^2b^4\beta^2 - 2352\delta^i_jr_{00}^2b^2\beta^2\\
& -576\delta^i_jr_{00}s_0\beta^3 - 288y^ir_{j0}s_0\beta^3 + 960y^ir_{j0}r_{00}\beta^2 - 576y^ir_{j0}r_0\beta^3\\
& +1728y^ir_{00|j}b^2\beta^3 - 1728y^ir_{j0|0}b^2\beta^3 - 1728s^i_{0|0}y_jb^2\beta^3 - 144b^ir_{j0}r_{00}\beta^3\\
& -1404y^is_jr_{00}\beta^2 - 648\overline{R}^i_j\beta^4 - 214488s^i_0s_{0j}\beta^4 - 2672y^iy_jr_{00}r_0b^2\beta
\end{aligned}
$$

$$-3328y^iy_jr_{00}s_0b^3\beta+2368y^iy_jr_{00}s_0b^2\beta-976y^iy_jr_{00}s_0b\beta-976y^iy_jr_{00}r_0b\beta$$
$$-3328y^iy_jr_{00}r_0b^3\beta+2304y^iy_jr_0s_0b\beta^2-1024y^iy_jr_{00}s_0b^5\beta$$
$$+1024y^iy_jr_{00}s_0b^4\beta+576\delta^i_jr_{00}r_0\beta^3-864\delta^i_jr_{00|0}b^2\beta^3+1128y^iy_jr^2_{00}b^4$$
$$+2376y^ir_{00|j}\beta^3-2376y^ir_{j0|0}\beta^3-2160s^i_{0|0}y_j\beta^3-1638\delta^i_jr^2_{00}\beta^2$$
$$-1188\delta^i_jr_{00|0}\beta^3+1050y^iy_jr^2_{00}b^2-144b^iy_jr_{00}r_0\beta^2+288b^iy_jr_{00|0}b^2\beta^2$$
$$+256y^iy_jr_{00|0}b^6\beta-2304y^ir_jr_{00}b\beta^3+504b^iy_jr^2_{00}b^2\beta+144b^iy_jr_{00}s_0\beta^2$$
$$-1024y^iy_jr_{00}r_0b^5\beta-512y^iy_jr_{00}r_0b^4\beta-1152b^iy_jr_{00}s_0b\beta^2$$
$$-1152b^iy_jr_{00}r_0b\beta^2-1152y^ib_jr_{00}s_0b\beta^2-1152y^ib_jr_{00}r_0b\beta^2$$
$$+336y^ir_{j0}r_{00}b^2\beta^2+2304y^ir_{j0}s_0b\beta^3+2304y^ir_{j0}r_0b\beta^3-2304y^is_jr_{00}b\beta^3$$
$$+288r^i_0y_jr_{00}b^2\beta^2+468r^i_0y_jr_{00}\beta^2+486\beta^2s^i_0y_jr_{00}+207y^iy_jr^2_{00})$$

$$t_5:=-4\beta^2\big[972\beta^2s^i_0y_jr_{00}b^2-1152\delta^i_jr_{00}s_0b^2\beta^3+2784\delta^i_jr_{00}s_0b\beta^3$$
$$+1536\delta^i_jr_{00}s_0b^3\beta^3+768\delta^i_jr_{00}r_0b^2\beta^3+2784\delta^i_jr_{00}r_0b\beta^3+293y^iy_jr_{00}s_0\beta$$
$$-982y^iy_jr_{00}r_0\beta+1374y^iy_jr_{00|0}b^2\beta+1488y^iy_jr_{00|0}b^4\beta-576y^iy_js^2_0b^2\beta^2$$
$$+3360y^iy_js^2_0b\beta^2+1536y^iy_js^2_0b^3\beta^2-2568y^iy_jr_0s_0\beta^2+7248y^iy_jr_{0m}s^m_0b^2\beta^2$$
$$+3072y^iy_jr_{0m}s^m_0b^4\beta^2-696y^iy_js_{0|0}b^2\beta^2-192y^iy_js_{0|0}b^4\beta^2-3072y^ir_jr_{00}b^3\beta^3$$
$$-192b^ib_jr^2_{00}b^2\beta^2-480y^ib_jr^2_{00}b^4\beta+84y^ib_jr^2_{00}b^2\beta-1848y^ib_jr_{00}s_0\beta^2$$
$$+648y^ib_jr_{00}r_0\beta^2-672y^ib_jr_{00|0}b^2\beta^2-384y^ib_jr_{00|0}b^4\beta^2-1260y^is_jr_{00}b^2\beta^2$$
$$-288y^is_jr_{00}\beta^2b^4+367y^iy_jr_{00|0}\beta-504y^iy_js^2_0\beta^2+3342y^iy_jr_{0m}s^m_0\beta^2$$
$$-462y^iy_js_{0|0}\beta^2+648b^iy_js_{0|0}\beta^3-3b^iy_jr^2_{00}\beta+402b^iy_jr_{00|0}\beta^2+228b^ib_jr^2_{00}\beta^2$$
$$-216b^ib_jr_{00|0}\beta^3+432y^ib_js_{0|0}\beta^3-351y^ib_jr^2_{00}\beta-78y^ib_jr_{00|0}\beta^2$$
$$+1392y^ir_jr_{00}\beta^3-432y^ib_jr_{0m}s^m_0\beta^3+1728y^is_jr_{00}\beta^3-864\delta^i_jr^2_{00}b^4\beta^2$$
$$-2424\delta^i_jr^2_{00}b^2\beta^2-1008\delta^i_jr_{00}s_0\beta^3-720y^ir_{j0}s_0\beta^3+600y^ir_{j0}r_{00}\beta^2$$
$$-1392y^ir_{j0}r_0\beta^3+4176y^ir_{00|j}b^2\beta^3+1152y^ir_{00|j}\beta^3b^4-4176y^ir_{j0|0}b^2\beta^3$$
$$-1152y^ir_{j0|0}\beta^3b^4-5184s^i_{0|0}y_jb^2\beta^3-1728s^i_{0|0}y_j\beta^3b^4-480b^ir_{j0}r_{00}\beta^3$$
$$-648y^is_js_0\beta^3-1206y^is_jr_{00}\beta^2-324g^iy_jr_{00}\beta^3+1536\delta^i_jr_{00}r_0b^3\beta^3$$
$$-1836\overline{R}^i_j\beta^4+39y^iy_jr^2_{00}-607716s^i_0s_{0j}\beta^4-2056y^iy_jr_{00}r_0b^2\beta$$
$$-2816y^iy_jr_{00}s_0b^3\beta+1268y^iy_jr_{00}s_0b^2\beta-776y^iy_jr_{00}s_0b\beta-776y^iy_jr_{00}r_0b\beta$$
$$-2816y^iy_jr_{00}r_0b^3\beta-2112y^iy_jr_0s_0b^2\beta^2+3360y^iy_jr_0s_0b\beta^2$$
$$+1536y^iy_jr_0s_0b^3\beta^2-1664y^iy_jr_{00}s_0b^5\beta+1472y^iy_jr_{00}s_0b^4\beta$$
$$+1392\delta^i_jr_{00}r_0\beta^3-2088\delta^i_jr_{00|0}b^2\beta^3-576\delta^i_jr_{00|0}b^4\beta^3-571968s^i_0s_{0j}b^2\beta^4$$
$$+432R4r_{j0}\beta^4+864y^is_{0|j}\beta^4+432b^ir_{j0|0}\beta^4-432b^ir_{00|j}\beta^4-432r^i_jr_{00}\beta^4$$
$$-864\delta^i_jr_{0m}s^m_0\beta^4-432\delta^i_js_{0|0}\beta^4+2772y^ir_{00|j}\beta^3-2772y^ir_{j0|0}\beta^3+432y^ir_{k0}s^k_j\beta^4$$
$$-864y^ir_{jk}s^k_0\beta^4-432y^is_{j|0}\beta^4-2808s^i_{0|0}y_j\beta^3-1005\delta^i_jr^2_{00}\beta^2-1386\delta^i_jr_{00|0}\beta^3+492y^iy_jr^2_{00}b^4$$
$$+324b^is_jr_{00}\beta^3-264b^iy_jr_{00}r_0\beta^2+528b^iy_jr_{00|0}b^2\beta^2+96b^iy_jr_{00|0}b^4\beta^2+416y^iy_jr_{00|0}b^6\beta$$
$$-5568y^ir_jr_{00}b\beta^3+768y^ir_jr_{00}\beta^3b^2+372b^iy_jr^2_{00}b^2\beta-672b^iy_jr_{00}s_0\beta^2-1664y^iy_jr_{00}r_0b^5\beta$$
$$-832y^iy_jr_{00}r_0b^4\beta+384b^iy_jr_{00}s_0b^2\beta^2-2112b^iy_jr_{00}s_0b\beta^2-768b^iy_jr_{00}s_0b^3\beta^2-96b^iy_jr_{00}r_0b^2\beta^2$$
$$+-2112b^iy_jr_{00}r_0b\beta^2-768b^iy_jr_{00}r_0b^3\beta^2-672y^ib_jr_{00}s_0b^2\beta^2-2304y^ib_jr_{00}s_0b\beta^2+351y^iy_jr^2_{00}b^2$$
$$+576y^ib_jr_{00}r_0b^2\beta^2-2304y^ib_jr_{00}r_0b\beta^2+144y^ir_{j0}r_{00}b^2\beta^2-96y^ir_{j0}r_{00}\beta^2b^4+5568y^ir_{j0}s_0b\beta^3$$
$$+5568y^ir_{j0}r_0b\beta^3-576y^ir_{j0}s_0b^2\beta^3+3072y^ir_{j0}s_0b^3\beta^3-768y^ir_{j0}r_0b^2\beta^3+3072y^ir_{j0}r_0b^3\beta^3$$
$$-96b^ir_{j0}r_{00}\beta^3b^2-5568y^is_jr_{00}b\beta^3+864y^is_jr_{00}\beta^3b^2-3072y^is_jr_{00}b^3\beta^3+528r^i_0y_jr_{00}b^2\beta^2$$

$$+96r^i_0y_jr_{00}\beta^2b^4+648r^i_0y_js_0\beta^3+402r^i_0y_jr_{00}\beta^2-216r^i_0b_jr_{00}\beta^3+729\beta^2s^i_0y_jr_{00}-1728\overline{R}^i_j\beta^4b^2\big]$$

$$\begin{aligned}t_6:=&-\beta\big[-4536\beta^2s^i_0y_jr_{00}b^2-2592\beta^2s^i_0y_jr_{00}b^4+9216y^ir_js_0b\beta^4+8576\delta^i_jr_{00}s_0b^2\beta^3\\
&-11072\delta^i_jr_{00}s_0b\beta^3-12800\delta^i_jr_{00}s_0b^3\beta^3-6400\delta^i_jr_{00}r_0b^2\beta^3-11072\delta^i_jr_{00}r_0b\beta^3\\
&+24y^iy_jr_{00}s_0\beta+1068y^iy_jr_{00}r_0\beta-1524y^iy_jr_{00|0}b^2\beta-2208y^iy_jr_{00|0}b^4\beta+2976y^iy_js_0^2b^2\beta^2\\
&-7104y^iy_js_0^2b\beta^2-6144y^iy_js_0^2b^3\beta^2+7152y^iy_jr_0s_0\beta^2-1152y^iy_js_ms_0^mb^2\beta^3-20400y^iy_jr_{0m}s_0^mb^2\beta^2\\
&-17664y^iy_jr_{0m}s_0^mb^4\beta^2+1104y^iy_js_{0|0}b^2\beta^2+384y^iy_js_{0|0}b^4\beta^2+4096y^ir_jr_{00}b^5\beta^3-288b^ib_jr_{00}s_0\beta^3\\
&+25600y^ir_jr_{00}b^3\beta^3+1152b^iy_jr_{0m}s_0^mb^2\beta^3-4608b^iy_js_{0|0}b^2\beta^3+864b^ib_jr_{00}^2b^2\beta^2-576b^ib_jr_{00}r_0\beta^3\\
&+1152b^ib_jr_{00|0}b^2\beta^3+512y^ib_jr_{00|0}b^6\beta^2+576y^ib_jr_{00}^2b^4\beta-1512y^ib_jr_{00}^2b^2\beta+6056y^ib_jr_{00}s_0\beta^2\\
&-2320y^ib_jr_{00}r_0\beta^2+2496y^ib_jr_{00|0}b^2\beta^2+2880y^ib_jr_{00|0}b^4\beta^2+9216y^ib_js_0^2b\beta^3-2304y^ib_jr_0s_0\beta^3\\
&+5760y^ib_jr_{0m}s_0^mb^2\beta^3-2304y^ib_js_{0|0}b^2\beta^3+2160y^is_jr_{00}b^2\beta^2+3456y^is_js_0b^2\beta^3+2880g^iy_jr_{00}\beta^3b^2\\
&+1296s^i_ks^k_0y_j\beta^4-1728b^is_jr_{00}\beta^3b^2-4608b^ir_jr_{00}b\beta^4-330y^iy_jr_{00|0}\beta+1992y^iy_js_0^2\beta^2\\
&-576y^iy_js_ms_0^m\beta^3-6276y^iy_jr_{0m}s_0^m\beta^2+564y^iy_js_{0|0}\beta^2-4464b^iy_js_{0|0}\beta^3-108b^iy_jr_{00}^2\beta\\
&-684b^iy_jr_{00|0}\beta^2-864b^iy_js_0^2\beta^3+144b^iy_jr_{0m}s_0^m\beta^3-2376b^ib_jr_{00}^2\beta^2+1872b^ib_jr_{00|0}\beta^3\\
&-2880y^ib_js_{0|0}\beta^3+162y^ib_jr_{00}^2\beta+268y^ib_jr_{00|0}\beta^2+3456r^i_jr_{00}b^2\beta^4+1152b^ir_jr_{00}\beta^4\\
&-5536y^ir_jr_{00}\beta^3-2304y^ir_js_0\beta^4+3312y^ib_jr_{0m}s_0^m\beta^3+1440b^is_jr_{00}\beta^4-6784y^is_jr_{00}\beta^3\\
&-1728y^is_js_0\beta^4+1152y^is_jr_0\beta^4+1944s^i_0b_jr_{00}\beta^3+512\delta^i_jr_{00|0}b^6\beta^3+3168\delta^i_jr_{00}^2b^4\beta^2\\
&+5424\delta^i_jr_{00}^2b^2\beta^2+2768\delta^i_jr_{00}s_0\beta^3-4608\delta^i_js_0^2b\beta^4-2304\delta^i_jr_0s_0\beta^4+6912\delta^i_jr_{0m}s_0^mb^2\beta^4\\
&+3456\delta^i_js_{0|0}b^2\beta^4+3040y^ir_{j0}s_0\beta^3-840y^ir_{j0}r_{00}\beta^2+5536y^ir_{j0}r_0\beta^3-16608y^ir_{00|j}b^2\beta^3\\
&-9600y^ir_{00|j}\beta^3b^4-1024y^ir_{00|j}b^6\beta^3+16608y^ir_{j0|0}b^2\beta^3+9600y^ir_{j0|0}\beta^3b^4+1024y^ir_{j0|0}b^6\beta^3\\
&-3456y^ir_{k0}s^k_jb^2\beta^4+6912y^ir_{kj}s^k_0b^2\beta^4+3456y^is_{j|0}b^2\beta^4+23040s^i_{0|0}y_jb^2\beta^3+18432s^i_{0|0}y_j\beta^3b^4\\
&+3072s^i_{0|0}y_jb^6\beta^3-6912y^is_{0|j}b^2\beta^4+2592b^ir_{j0}r_{00}\beta^3-576b^ir_{j0}s_0\beta^4-1152b^ir_{j0}r_0\beta^4\\
&-3456b^ir_{j0|0}b^2\beta^4+3456b^ir_{00|j}b^2\beta^4+5616y^is_js_0\beta^3+2052y^is_jr_{00}\beta^2+2304g^iy_jr_{00}\beta^3\\
&-12800\delta^i_jr_{00}r_0b^3\beta^3-4608\delta^i_jr_0s_0b\beta^4-2048\delta^i_jr_{00}s_0b^5\beta^3+2048\delta^i_jr_{00}s_0b^4\beta^3-2048\delta^i_jr_{00}r_0b^5\beta^3\\
&+8856\overline{R}^i_j\beta^4+2931336s^i_0s_{0j}\beta^4+1296s^i_{j|0}\beta^5-2592s^i_{j|0}\beta^5+3024y^iy_jr_{00}r_0b^2\beta+4608y^iy_jr_{00}s_0b^3\beta\\
&-1584y^iy_jr_{00}s_0b^2\beta+1200y^iy_jr_{00}s_0b\beta+1200y^iy_jr_{00}r_0b\beta+4608y^iy_jr_{00}r_0b^3\beta+12096y^iy_jr_0s_0b^2\beta^2\\
&-7104y^iy_jr_0s_0b\beta^2-6144y^iy_jr_0s_0b^3\beta^2+3840y^iy_jr_{00}s_0b^5\beta-3264y^iy_jr_{00}s_0b^4\beta-5536\delta^i_jr_{00}r_0\beta^3\\
&+8304\delta^i_jr_{00|0}b^2\beta^3+4800\delta^i_jr_{00|0}b^4\beta^3+5719680s^i_0s_{0j}b^2\beta^4+2287872s^i_0s_{0j}\beta^4b^4\\
&-4320r^i_0r_{j0}\beta^4-7776y^is_{0|j}\beta^4-4320b^ir_{j0|0}\beta^4+4320b^ir_{00|j}\beta^4-1296s^i_{0|0}b_j\beta^4+4320r^i_jr_{00}\beta^4\\
&+7776\delta^i_jr_{0m}s_0^m\beta^4+3888\delta^i_js_{0|0}\beta^4-7112y^ir_{00|j}\beta^3+7112y^ir_{j0|0}\beta^3-3888y^ir_{k0}s^k_j\beta^4\\
&+7776y^ir_{kj}s^k_0\beta^4+3888y^is_{j|0}\beta^4+7620s^i_{0|0}y_j\beta^3+1506\delta^i_jr_{00}^2\beta^2+3556\delta^i_jr_{00|0}\beta^3\\
&-3456b^is_jr_{00}\beta^3-576b^iy_jr_0s_0\beta^3+9216b^iy_js_0^2b\beta^3+720b^iy_jr_{00}r_0\beta^2-1440b^iy_jr_{00|0}b^2\beta^2\\
&-576b^iy_jr_{00|0}b^4\beta^2-960y^iy_jr_{00|0}b^6\beta+22144y^ir_jr_{00}b\beta^3-6400y^ir_jr_{00}\beta^3b^2-1024y^ir_jr_{00}\beta^3b^4\\
&-648b^iy_jr_{00}^2b^2\beta+3816b^iy_jr_{00}s_0\beta^2+3840y^iy_jr_{00}r_0b^5\beta+1920y^iy_jr_{00}r_0b^4\beta+3072y^iy_jr_0s_0b^4\beta^2\\
&+288b^iy_jr_{00}s_0b^2\beta^2+5760b^iy_jr_{00}s_0b\beta^2+4608b^iy_jr_{00}s_0b^3\beta^2+576b^iy_jr_{00}r_0b^2\beta^2+5760b^iy_jr_{00}r_0b\beta^2\\
&+4608b^iy_jr_{00}r_0b^3\beta^2+9216b^iy_jr_0s_0b\beta^3-4608b^ib_jr_{00}s_0b\beta^3-4608b^ib_jr_{00}r_0b\beta^3+2336y^ib_jr_{00}s_0b^2\beta^2\\
&+7168y^ib_jr_{00}s_0b\beta^2-512y^ib_jr_{00}s_0b^3\beta^2-4288y^ib_jr_{00}r_0b^2\beta^2+7168y^ib_jr_{00}r_0b\beta^2-512y^ib_jr_{00}r_0b^3\beta^2\\
&+9216y^ib_jr_0s_0b\beta^3-2048y^ib_jr_{00}s_0b^5\beta^2+2048y^ib_jr_{00}s_0b^4\beta^2-2048y^ib_jr_{00}r_0b^5\beta^2\\
&-1024y^ib_jr_{00}r_0b^4\beta^2-1024\delta^i_jr_{00}r_0b^4\beta^3+288y^ir_{j0}r_{00}b^2\beta^2+768y^ir_{j0}r_{00}\beta^2b^4-22144y^ir_{j0}s_0b\beta^3\\
&-22144y^ir_{j0}r_0b\beta^3+5440y^ir_{j0}s_0b^2\beta^3-25600y^ir_{j0}s_0b^3\beta^3+6400y^ir_{j0}r_0b^2\beta^3-25600y^ir_{j0}r_0b^3\beta^3\\
&+1024y^ir_{j0}s_0\beta^3b^4-4096y^ir_{j0}s_0b^5\beta^3+1024y^ir_{j0}r_0b^4\beta^3-4096y^ir_{j0}r_0b^5\beta^3+1152b^ir_{j0}r_{00}\beta^3b^2\end{aligned}$$

$$
\begin{aligned}
&+4608b^ir_{j0}s_0b\beta^4+4608b^ir_{j0}r_0b\beta^4-4608b^is_jr_{00}b\beta^4+22144y^is_jr_{00}b\beta^3-6880y^is_jr_{00}\beta^3b^2\\
&-1024y^is_jr_{00}\beta^3b^4+25600y^is_jr_{00}b^3\beta^3+4096y^is_jr_{00}b^5\beta^3+4608y^is_js_0b\beta^4-4608y^is_jr_0b\beta^4\\
&-3072y^iy_jr_{0m}s_0^mb^6\beta^2-1440r_0^iy_jr_{00}b^2\beta^2-576r_0^iy_jr_{00}\beta^2b^4-4608r_0^iy_js_0b^2\beta^3+1152r_0^ib_jr_{00}\beta^3b^2\\
&-3456r_0^ir_{j0}b^2\beta^4-4464r_0^iy_js_0\beta^3-684r_0^iy_jr_{00}\beta^2+1872r_0^ib_jr_{00}\beta^3-1944\beta^3s_0^iy_js_0\\
&-1620\beta^2s_0^iy_jr_{00}+6912\overline{R}_j^i\beta^4b^4-27y^iy_jr_{00}^2-504y^iy_jr_{00}^2b^4-324y^iy_jr_{00}^2b^2+17280\overline{R}_j^i\beta^4b^2]
\end{aligned}
$$

$$
\begin{aligned}
t_7:=\ &-1728\beta^2s_0^iy_jr_{00}b^2-3888\beta^3s_0^iy_js_0b^2-2160\beta^2s_0^iy_jr_{00}b^4-576\beta^2s_0^iy_jr_{00}b^6-3072y^ir_js_0b^2\beta^4\\
&+17664y^ir_js_0b\beta^4+12288y^ir_js_0b^3\beta^4+6656\delta_j^ir_{00}s_0b^2\beta^3-5792\delta_j^ir_{00}s_0b\beta^3-10496\delta_j^ir_{00}s_0b^3\beta^3\\
&-5248\delta_j^ir_{00}r_0b^2\beta^3-5792\delta_j^ir_{00}r_0b\beta^3-1536y^iy_js_ms_0^mb^4\beta^3+16y^iy_jr_{00}s_0\beta-9120y^iy_jr_{0m}s_0^mb^4\beta^2\\
&+148y^iy_jr_{00}r_0\beta-216y^iy_jr_{00|0}b^2\beta-384y^iy_jr_{00|0}b^4\beta+2272y^iy_js_0^2b^2\beta^2-1600y^iy_js_0^2b\beta^2\\
&-1792y^iy_js_0^2b^3\beta^2+2416y^iy_jr_0s_0\beta^2-2400y^iy_js_ms_0^mb^2\beta^3-6984y^iy_jr_{0m}s_0^mb^2\beta^2+144y^iy_js_{0|0}b^2\beta^2\\
&-96y^iy_js_{0|0}b^4\beta^2+7168y^ir_jr_{00}b^5\beta^3+20992y^ir_jr_{00}b^3\beta^3+1824b^iy_jr_{0m}s_0^mb^2\beta^3+1536b^iy_jr_{0m}s_0^mb^4\beta^3\\
&-6432b^iy_js_{0|0}b^2\beta^3-2688b^iy_js_{0|0}b^4\beta^3+144b^ib_jr_{00}^2b^2\beta^2-5136b^ib_jr_{00}s_0\beta^3-1056b^ib_jr_{00}r_0\beta^3\\
&+2112b^ib_jr_{00|0}b^2\beta^3+384b^ib_jr_{00|0}b^4\beta^3+768y^ib_jr_{00|0}b^6\beta^2-96y^ib_jr_{00}^2b^4\beta-684y^ib_jr_{00}^2b^2\beta\\
&+1908y^ib_jr_{00}s_0\beta^2-1032y^ib_jr_{00}r_0\beta^2+1152y^ib_jr_{00|0}b^2\beta^2+2016y^ib_jr_{00|0}b^4\beta^2-1152y^ib_js_0^2b^2\beta^3\\
&+13440y^ib_js_0^2b\beta^3+6144y^ib_js_0^2b^3\beta^3-3648y^ib_jr_0s_0\beta^3+9120y^ib_jr_{0m}s_0^mb^2\beta^3+5376y^ib_jr_{0m}s_0^mb^4\beta^3\\
&-2784y^ib_js_{0|0}b^2\beta^3-768y^ib_js_{0|0}b^4\beta^3-36y^is_jr_{00}b^2\beta^2-576y^is_jr_{00}b^6\beta^2-1440y^is_jr_{00}\beta^2b^4\\
&+5904y^is_js_0b^2\beta^3+1152y^is_js_0\beta^3b^4+4128s^iy_jr_{00}\beta^3b^2+2052s_k^is_0^ky_j\beta^4+2112s^iy_jr_{00}\beta^3b^4\\
&-4032b^is_jr_{00}\beta^3b^2-576b^is_jr_{00}\beta^3b^4+1536b^ir_jr_{00}b^2\beta^4-9984b^ir_jr_{00}b\beta^4-128y^iy_js_0^2b^4\beta^2\\
&-40y^iy_jr_{00|0}\beta+1096y^iy_js_0^2\beta^2-708y^iy_js_ms_0^m\beta^3-1628y^iy_jr_{0m}s_0^m\beta^2+80y^iy_js_{0|0}\beta^2\\
&-2976b^iy_js_{0|0}\beta^3-72b^iy_jr_{00}^2\beta-144b^iy_jr_{00|0}\beta^2+1488b^iy_js_0^2\beta^3-1728b^iy_js_ms_0^m\beta^4\\
&+312b^iy_jr_{0m}s_0^m\beta^3-1836b^ib_jr_{00}^2\beta^2+1608b^ib_jr_{00|0}\beta^3+864b^ib_jr_{0m}s_0^m\beta^4+1728b^ib_js_{0|0}\beta^4\\
&-1848y^ib_js_{0|0}\beta^3-39y^ib_jr_{00}^2\beta+114y^ib_jr_{00|0}\beta^2+2016y^ib_js_0^2\beta^3-432s^ib_jr_{00}\beta^4+7488r_j^ir_{00}b^2\beta^4\\
&+2304r_j^ir_{00}\beta^4b^4+2496b^ir_jr_{00}\beta^4-2896y^ir_jr_{00}\beta^3-4416y^ir_js_0\beta^4-864y^ib_js_ms_0^m\beta^4\\
&+2568y^ib_jr_{0m}s_0^m\beta^3+3312b^is_jr_{00}\beta^4-3472y^is_jr_{00}\beta^3-3264y^is_js_0\beta^4+2208y^is_jr_0\beta^4\\
&+3456s_k^is_0^ky_jb^2\beta^4+2916s_0^ib_jr_{00}\beta^3+2304\delta_j^is_{0|0}\beta^4b^4+4608\delta_j^ir_{0m}s_0^mb^4\beta^4+896\delta_j^ir_{00|0}b^6\beta^3\\
&+768\delta_j^is_0^2b^2\beta^4-6144\delta_j^is_0^2b^3\beta^4+1488\delta_j^ir_{00}^2b^4\beta^2+1752\delta_j^ir_{00}^2b^2\beta^2+992\delta_j^ir_{00}s_0\beta^3-8832\delta_j^is_0^2b\beta^4\\
&-4416\delta_j^ir_0s_0\beta^4+13248\delta_j^ir_{0m}s_0^mb^2\beta^4+6624\delta_j^is_{0|0}b^2\beta^4+1744y^ir_{j0}s_0\beta^3-156y^ir_{j0}r_{00}\beta^2\\
&+2896y^ir_{j0}r_0\beta^3-8688y^ir_{00|j}b^2\beta^3-7872y^ir_{00|j}\beta^3b^4-1792y^ir_{00|j}b^6\beta^3+8688y^ir_{j0|0}b^2\beta^3\\
&+7872y^ir_{j0|0}\beta^3b^4+1792y^ir_{j0|0}b^6\beta^3-6624y^ir_{k0}s_j^kb^2\beta^4-2304y^ir_{k0}s_j^k\beta^4b^4+13248y^ir_{jk}s_0^kb^2\beta^4\\
&+4608y^ir_{jk}s_0^k\beta^4b^4+6624y^is_{j|0}b^2\beta^4+2304y^is_{j|0}\beta^4b^4+12640s_{0|0}^iy_jb^2\beta^3+16896s_{0|0}^iy_j\beta^3b^4\\
&+7168s_{0|0}^iy_jb^6\beta^3+512s_{0|0}^iy_j\beta^3b^8-13248y^is_{0|j}b^2\beta^4-4608y^is_{0|j}\beta^4b^4+1824b^ir_{j0}r_{00}\beta^3\\
&-864b^ir_{j0}s_0\beta^4-2496b^ir_{j0}r_0\beta^4-7488b^ir_{j0|0}b^2\beta^4-2304b^ir_{j0|0}\beta^4b^4+7488b^ir_{00|j}b^2\beta^4\\
&+2304b^ir_{00|j}\beta^4b^4+4284y^is_js_0\beta^3+432y^is_jr_{00}\beta^2+1644s^iy_jr_{00}\beta^3+432s^iy_js_0\beta^4-10496\delta_j^ir_{00}r_0b^3\beta^3\\
&-8832\delta_j^ir_0s_0b\beta^4-3584\delta_j^ir_{00}s_0b^5\beta^3+3584\delta_j^ir_{00}s_0b^4\beta^3-3584\delta_j^ir_{00}r_0b^5\beta^3+5892\overline{R}_j^i\beta^4\\
&+1950252s_0^is_{0j}\beta^4+3024s_{j|0}^i\beta^5-6048s_{j|0}^i\beta^5+520y^iy_jr_{00}r_0b^2\beta+896y^iy_jr_{00}s_0b^3\beta\\
&-524y^iy_jr_{00}s_0b^2\beta+224y^iy_jr_{00}s_0b\beta+224y^iy_jr_{00}r_0b\beta+896y^iy_jr_{00}r_0b^3\beta+6208y^iy_jr_0s_0b^2\beta^2\\
&-1600y^iy_jr_0s_0b\beta^2-1792y^iy_jr_0s_0b^3\beta^2+896y^iy_jr_{00}s_0b^5\beta-1040y^iy_jr_{00}s_0b^4\beta-2896\delta_j^ir_{00}r_0\beta^3\\
&+4344\delta_j^ir_{00|0}b^2\beta^3+3936\delta_j^ir_{00|0}b^4\beta^3-864r_0^is_j\beta^5+5910336s_0^is_{0j}b^2\beta^4+4957056s_0^is_{0j}\beta^4b^4\\
&+1016832s_0^is_{0j}\beta^4b^6-4464r_0^ir_{j0}\beta^4-7200y^is_{0|j}\beta^4-864b^is_{j|0}\beta^5-864y^is_ms_0^m\beta^5+3456s_{j|0}^ib^2\beta^5\\
&-6912s_{j|0}^ib^2\beta^5-4464b^ir_{j0|0}\beta^4+4464b^ir_{00|j}\beta^4-2376s_{0|0}^ib_j\beta^4+4464r_j^ir_{00}\beta^4+1728r_j^is_0\beta^5
\end{aligned}
$$

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\begin{aligned}
&+7200\delta^i_j r_{0m} s^m_0 \beta^4 + 3600\delta^i_j s_{0|0}\beta^4 + 1728\delta^i_j s_m s^m_0\beta^5 - 2708 y^i r_{00|j}\beta^3 + 2708 y^i r_{j0|0}\beta^3 - 3600 y^i r_{k0} s^k_j \beta^4\\
&+7200 y^i r_{jk} s^k_0\beta^4 + 3600 y^i s_{j|0}\beta^4 + 2960 s^i_{0|0} y_j \beta^3 - 768\delta^i_j s_0^2\beta^4 + 351\delta^i_j r_{00}^2\beta^2 + 1354\delta^i_j r_{00|0}\beta^3\\
&+1728 b^i s_{0|j}\beta^5 + 864 b^i r_{k0} s^k_j\beta^5 - 1728 b^i r_{jk} s^k_0 \beta^5 - 864 s^i r_{j0}\beta^5 - 3492 b^i s_j r_{00}\beta^3 - 1296 b^i s_j s_0\beta^4\\
&-3456 s^i_{0|0} b_j b^2\beta^4 + 9216 b^i y_j s_0^2 b^3\beta^3 - 864 b^i y_j r_0 s_0 \beta^3 - 1920 b^i y_j s_0^2 b^2\beta^3 + 12672 b^i y_j s_0^2 b\beta^3\\
&+216 b^i y_j r_{00} r_0 \beta^2 - 432 b^i y_j r_{00|0} b^2\beta^2 - 288 b^i y_j r_{00|0} b^4 \beta^2 - 224 y^i y_j r_{00|0} b^6\beta + 512 y^i y_j s_0^2 b^5\beta^2\\
&-6144 b^i r_j r_{00} b^3\beta^4 + 11584 y^i r_j r_{00} b\beta^3 - 5248 y^i r_j r_{00}\beta^3 b^2 - 1792 y^i r_j r_{00}\beta^3 b^4 - 180 b^i y_j r_{00}^2 b^2\beta\\
&+1404 b^i y_j r_{00} s_0\beta^2 + 896 y^i y_j r_{00} r_0 b^5\beta + 448 y^i y_j r_{00} r_0 b^4\beta + 512 y^i y_j r_0 s_0 b^5\beta^2 + 3328 y^i y_j r_0 s_0 b^4\beta^2\\
&+864 b^i y_j r_{00} s_0 b^2\beta^2 + 1728 b^i y_j r_{00} s_0 b\beta^2 + 2304 b^i y_j r_{00} s_0 b^3\beta^2 + 288 b^i y_j r_{00} r_0 b^2\beta^2 + 1728 b^i y_j r_{00} r_0 b\beta^2\\
&+2304 b^i y_j r_{00} r_0 b^3\beta^2 - 1152 b^i y_j r_0 s_0 b^2\beta^3 + 12672 b^i y_j r_0 s_0 b\beta^3 + 9216 b^i y_j r_0 s_0 b^3\beta^3 + 576 b^i y_j r_{00} s_0 b^4\beta^2\\
&+960 b^i b_j r_{00} s_0 b^2\beta^3 - 8448 b^i b_j r_{00} s_0 b\beta^3 - 3072 b^i b_j r_{00} s_0 b^3\beta^3 - 384 b^i b_j r_{00} r_0 b^2\beta^3 - 8448 b^i b_j r_{00} r_0 b\beta^3\\
&-3072 b^i b_j r_{00} r_0 b^3\beta^3 - 1440 y^i b_j r_{00} s_0 b^2\beta^2 + 2688 y^i b_j r_{00} s_0 b\beta^2 - 768 y^i b_j r_{00} s_0 b^3\beta^2 - 2976 y^i b_j r_{00} r_0 b^2\beta^2\\
&+2688 y^i b_j r_{00} r_0 b\beta^2 - 768 y^i b_j r_{00} r_0 b^3\beta^2 - 3840 y^i b_j r_0 s_0 b^2\beta^3 + 13440 y^i b_j r_0 s_0 b\beta^3 + 6144 y^i b_j r_0 s_0 b^3\beta^3\\
&-3072 y^i b_j r_{00} s_0 b^5\beta^2 + 1728 y^i b_j r_{00} s_0 b^4\beta^2 - 3072 y^i b_j r_{00} r_0 b^5\beta^2 - 1536 y^i b_j r_{00} r_0 b^4\beta^2 - 1792\delta^i_j r_{00} r_0 b^4\beta^3\\
&-3072\delta^i_j r_0 s_0 b^2\beta^4 - 6144\delta^i_j r_0 s_0 b^3\beta^4 + 336 y^i r_{j0} r_{00} b^2\beta^2 + 576 y^i r_{j0} r_{00}\beta^2 b^4 - 11584 y^i r_{j0} s_0 b\beta^3\\
&-11584 y^i r_{j0} r_0 b\beta^3 + 5152 y^i r_{j0} s_0 b^2\beta^3 - 20992 y^i r_{j0} s_0 b^3\beta^3 + 5248 y^i r_{j0} r_0 b^2\beta^3 - 20992 y^i r_{j0} r_0 b^3\beta^3\\
&+2176 y^i r_{j0} s_0\beta^3 b^4 - 7168 y^i r_{j0} s_0 b^5\beta^3 + 1792 y^i r_{j0} r_0 b^4\beta^3 - 7168 y^i r_{j0} r_0 b^5\beta^3 + 1344 b^i r_{j0} r_{00}\beta^3 b^2\\
&-1152 b^i r_{j0} s_0 b^2\beta^4 + 9984 b^i r_{j0} s_0 b\beta^4 + 6144 b^i r_{j0} s_0 b^3\beta^4 - 1536 b^i r_{j0} r_0 b^2\beta^4 + 9984 b^i r_{j0} r_0 b\beta^4\\
&+6144 b^i r_{j0} r_0 b^3\beta^4 + 1728 b^i s_j r_{00} b^2\beta^4 - 9984 b^i s_j r_{00} b\beta^4 - 6144 b^i s_j r_{00} b^3\beta^4 + 11584 y^i s_j r_{00} b\beta^3\\
&-5296 y^i s_j r_{00}\beta^3 b^2 - 1600 y^i s_j r_{00}\beta^3 b^4 + 20992 y^i s_j r_{00} b^3\beta^3 + 7168 y^i s_j r_{00} b^5\beta^3 - 1920 y^i s_j s_0 b^2\beta^4\\
&+8832 y^i s_j s_0 b\beta^4 + 6144 y^i s_j s_0 b^3\beta^4 + 1536 y^i s_j r_0 b^2\beta^4 - 8832 y^i s_j r_0 b\beta^4 - 6144 y^i s_j r_0 b^3\beta^4\\
&-128 y^i y_j s_{0|0}\beta^2 b^6 - 3328 y^i y_j r_{0m} s^m_0 b^6\beta^2 + 3888 s^i_0 b_j r_{00}\beta^3 b^2 - 432 r^i_0 y_j r_{00} b^2\beta^2 + 17856\overline{R}^i_j\beta^4 b^2\\
&-288 r^i_0 y_j r_{00}\beta^2 b^4 - 6432 r^i_0 y_j s_0 b^2\beta^3 - 2688 r^i_0 y_j s_0\beta^3 b^4 + 2112 r^i_0 b_j r_{00}\beta^3 b^2 + 384 r^i_0 b_j r_{00}\beta^3 b^4\\
&-7488 r^i_0 r_{j0} b^2\beta^4 - 2304 r^i_0 r_{j0}\beta^4 b^4 - 2976 r^i_0 y_j s_0\beta^3 - 144 r^i_0 y_j r_{00}\beta^2 + 1608 r^i_0 b_j r_{00}\beta^3 + 1728 r^i_0 b_j s_0\beta^4\\
&-1944\beta^3 s^i_0 y_j s_0 - 396\beta^2 s^i_0 y_j r_{00} + 14976\overline{R}^i_j\beta^4 b^4 + 3072\overline{R}^i_j\beta^4 b^6 - 3y^i y_j r_{00}^2 - 60 y^i y_j r_{00}^2 b^4 - 36 y^i y_j r_{00}^2 b^2
\end{aligned}
$$

$$
\begin{aligned}
t_8 := {}& 648 s^i_k s^k_j\beta^5 - 773216 s^i_0 s_{0j}\beta^3 - 2916 s^i_{j|0}\beta^4 + 5832 s^i_{j|0}\beta^4 - 1620 s^i_0 b_j r_{00}\beta^2 + 1944 y^i s_j r_{00} b^2\beta^2\\
&+864 y^i s_j r_{00}\beta^2 b^4 + 2720 y^i s_j s_0 b^2\beta^3 + 512 y^i s_j s_0\beta^3 b^4 - 3296 b^i s_j r_{00}\beta^3 b^2 - 512 b^i s_j r_{00}\beta^3 b^4\\
&+2384 y^i s_j s_0\beta^3 + 972 y^i s_j r_{00}\beta^2 - 1864192 s^i_0 s_{0j} b^6\beta^3 - 169472 s^i_0 s_{0j}\beta^3 b^8 + 2440 r^i_0 r_{j0}\beta^3 - 3456 b^i s_{0|j}\beta^4\\
&-3456 r^i_j s_0\beta^4 - 3024\delta^i_j s_m s^m_0\beta^4 + 1756 y^i r_{k0} s^k_j\beta^3 - 2440 b^i r_{00|j}\beta^3 + 1728 s^i_{0|0} b_j\beta^3 - 1728 b^i r_{k0} s^k_j\beta^4\\
&-306\delta^i_j r_{00|0}\beta^2 + 1000\delta^i_j s_0^2\beta^3 - 3512 y^i r_{jk} s^k_0\beta^3 - 1756 y^i s_{j|0}\beta^3 - 664 s^i_{0|0} y_j\beta^2 - 1756\delta^i_j s_{0|0}\beta^3\\
&-48\delta^i_j r_{00}^2\beta + 3512 y^i s_{0|j}\beta^3 + 1728 b^i s_{j|0}\beta^4 + 1512 y^i s_m s^m_0\beta^4 + 2 y^i y_j r_{00|0} + 12 b^i y_j r_{00}^2 + 9 y^i b_j r_{00}^2\\
&-2440 r^i_j r_{00}\beta^3 + 612 y^i r_{00|j}\beta^2 - 612 y^i r_{j0|0}\beta^2 + 6912 s^i_{j|0}\beta^4 b^4 + 2440 b^i r_{j0|0}\beta^3 - 6912 s^i_{j|0} b^2\beta^4\\
&-3456 s^i_{j|0}\beta^4 b^4 + 3456 b^i r_{jk} s^k_0\beta^4 + 13824 s^i_{j|0} b^2\beta^4 + 1728 g^i r_{j0}\beta^4 - 3512\delta^i_j r_{0m} s^m_0\beta^3 - 3648 y^i s_{j|0}\beta^3 b^4\\
&-512 y^i s_{j|0} b^6\beta^3 - 3680 s^i_{0|0} y_j b^2\beta^2 + 3456 b^i s_j s_0\beta^3 + 1692 b^i s_j r_{00}\beta^2 - 1476 y^i s_j s_0\beta^2 - 36 y^i s_j r_{00}\beta\\
&-684 b^i b_j r_{00|0}\beta^2 - 1584 b^i b_j r_{0m} s^m_0\beta^3 - 1008 y^i b_j r_{0m} s^m_0\beta^2 + 1024 y^i s_{0|j} b^6\beta^3 + 368 b^i r_{j0} s_0\beta^3\\
&+564 y^i b_j s_{0|0}\beta^2 - 8 y^i y_j r_{00} r_0 - 236 y^i y_j s_0^2\beta + 316 y^i y_j s_m s^m_0\beta^2 + 220 y^i y_j r_{0m} s^m_0\beta - 4 y^i y_j s_{0|0}\beta\\
&+12 b^i y_j r_{00|0}\beta - 7008 s^i_{0|0} y_j\beta^2 b^4 - 5120 s^i_{0|0} y_j\beta^2 b^6 - 1024 s^i_{0|0} y_j\beta^2 b^8 + 4 y^i y_j r_{00} s_0 + 1728 b^i s_{j|0} b^2\beta^4\\
&+5184 s^i_{0|0} b_j b^2\beta^3 + 3456 s^i_{0|0} b_j\beta^3 b^4 - 592 g^i y_j r_{00}\beta^2 + 840\delta^i_j r_{00} r_0\beta^2 - 1260\delta^i_j r_{00|0} b^2\beta^2\\
&-1584\delta^i_j r_{00|0} b^4\beta^2 + 24 b^i y_j r_{00}^2 b^2 - 1024 y^i r_{jk} s^k_0 b^6\beta^3 - 2144 b^i r_j r_{00}\beta^3 - 708 b^i r_{j0} r_{00}\beta^2\\
&+2144 b^i r_{j0} r_0\beta^3 - 2736 b^i b_j s_{0|0}\beta^3 + 600 b^i b_j r_{00}^2\beta + 9984 y^i s_{0|j} b^2\beta^3 + 7296 y^i s_{0|j}\beta^3 b^4 - 512 r^i_j r_{00}\beta^3 b^6\\
&-6432 r^i_j r_{00}\beta^3 b^2 + 24 y^i y_j r_{00|0} b^4 + 12 y^i y_j r_{00|0} b^2 + 576 b^i s_j r_0\beta^4 - 9984\delta^i_j r_{0m} s^m_0 b^2\beta^3
\end{aligned}
$$

$$-7296\delta^i_j r_{0m}s^m_0 b^4\beta^3-4992\delta^i_j s_{0|0}b^2\beta^3-3648\delta^i_j s_{0|0}b^4\beta^3-576y^ir_{j0}s_0\beta^2-840y^ir_{j0}r_0\beta^2$$
$$+12y^ir_{j0}r_{00}\beta-1152b^ir_js_0\beta^4+3328y^ir_js_0\beta^3+840y^ir_jr_{00}\beta^2+936y^ib_js_ms^m_0\beta^3+6432b^ir_{j0|0}b^2\beta^3$$
$$+4224b^ir_{j0|0}\beta^3b^4+512b^ir_{j0|0}b^6\beta^3-6432b^ir_{00|j}b^2\beta^3-4224b^ir_{00|j}\beta^3b^4-512b^ir_{00|j}b^6\beta^3$$
$$-576g^iy_js_0\beta^3+2520y^ir_{00|j}b^2\beta^2+3168y^ir_{00|j}\beta^2b^4+1152y^ir_{00|j}\beta^2b^6-2520y^ir_{j0|0}b^2\beta^2$$
$$-3168y^ir_{j0|0}\beta^2b^4-1152y^ir_{j0|0}\beta^2b^6+4992y^ir_{k0}s^k_jb^2\beta^3+3648y^ir_{k0}s^k_j\beta^3b^4+512y^ir_{k0}s^k_jb^6\beta^3$$
$$-9984y^ir_{jk}s^k_0b^2\beta^3-7296y^ir_{jk}s^k_0\beta^3b^4+16y^iy_jr_{00|0}b^6+1728y^is_ms^m_0b^2\beta^4+48y^ib_jr^2_{00}b^4$$
$$+96y^ib_jr^2_{00}b^2-512\delta^i_js^2_0b^4\beta^3+2048\delta^i_js^2_0b^5\beta^3-512\delta^i_js_{0|0}b^6\beta^3-1024\delta^i_jr_{0m}s^m_0b^6\beta^3-576\delta^i_jr_{00|0}b^6\beta^2$$
$$-3456\delta^i_js_ms^m_0b^2\beta^4-360\delta^i_jr^2_{00}b^4\beta-312\delta^i_jr^2_{00}b^2\beta-228\delta^i_jr_{00}s_0\beta^2-704\delta^i_js^2_0b^2\beta^3+6656\delta^i_js^2_0b\beta^3$$
$$+9728\delta^i_js^2_0b^3\beta^3+3328\delta^i_jr_0s_0\beta^3-24y^ib_jr_{00|0}\beta-3456b^is_{0|j}b^2\beta^4+3456b^ir_{jk}s^k_0b^2\beta^4-1664y^is_jr_0\beta^3$$
$$-4224r^i_jr_{00}\beta^3b^4-3456r^i_js_0b^2\beta^4-1336b^iy_js^2_0\beta^2+2088b^iy_js_ms^m_0\beta^3-232b^iy_jr_{0m}s^m_0\beta^2$$
$$+952b^iy_js_{0|0}\beta^2-1392y^ib_js^2_0\beta^2+1728g^ir_{j0}b^2\beta^4+576g^ib_jr_{00}\beta^3-1728b^ir_{k0}s^k_jb^2\beta^4-4992y^is_{j|0}b^2\beta^3$$
$$-1328y^iy_jr_0s_0b^2\beta+128y^iy_jr_0s_0b\beta+128y^iy_jr_0s_0b^3\beta-256y^iy_jr_0s_0b^5\beta-1088y^iy_jr_0s_0b^4\beta$$
$$-24b^iy_jr_{00}s_0b^2\beta-192b^iy_jr_{00}s_0b\beta-384b^iy_jr_{00}s_0b^3\beta-48b^iy_jr_{00}r_0b^2\beta+768y^ib_jr_{00}r_0b^4\beta$$
$$+1536y^ib_jr_0s_0b^4\beta^2-480y^ib_jr_{00}s_0b\beta+384y^ib_jr_{00}s_0b^3\beta+912y^ib_jr_{00}r_0b^2\beta-480y^ib_jr_{00}r_0b\beta$$
$$+384y^ib_jr_{00}r_0b^3\beta+1704y^ib_jr_{00}s_0b^2\beta+6912b^ib_jr_0s_0b\beta^3+4800y^ib_jr_0s_0b^2\beta^2-7104y^ib_jr_0s_0b\beta^2$$
$$-6144y^ib_jr_0s_0b^3\beta^2+1536y^ib_jr_{00}s_0b^5\beta+96y^ib_jr_{00}s_0b^4\beta+1536y^ib_jr_{00}r_0b^5\beta+4608b^ib_jr_{00}r_0b^3\beta^2$$
$$+576b^ib_jr_{00}r_0b^2\beta^2+5760b^ib_jr_{00}r_0b\beta^2+5760b^ib_jr_{00}s_0b\beta^2+4608b^ib_jr_{00}s_0b^3\beta^2-2048b^iy_jr_0s_0b^5\beta^2$$
$$+512b^iy_jr_0s_0b^4\beta^2+1728b^ib_jr_{00}s_0b^2\beta^2-9728b^iy_jr_0s_0b^3\beta^2-288b^iy_jr_{00}s_0b^4\beta-192b^iy_jr_{00}r_0b\beta$$
$$+-384b^iy_jr_{00}r_0b^3\beta+1280b^iy_jr_0s_0b^2\beta^2-6080b^iy_jr_0s_0b\beta^2-3456s^i_ks^k_0y_j\beta^3b^4-1944s^i_0b_js_0\beta^3$$
$$-4320s^i_ks^k_0y_jb^2\beta^3+2592\beta^2s^i_0y_js_0b^4+432\beta s^i_0y_jr_{00}b^4+288\beta s^i_0y_jr_{00}b^6-3032b^is_jr_{00}\beta^3$$
$$-864b^is_js_0\beta^4-4536s^i_0b_jr_{00}b^2\beta^2-2592s^i_0b_jr_{00}\beta^2b^4+48r^i_0y_jr_{00}b^2\beta+3216r^i_0y_js_0b^2\beta^2$$
$$+48r^i_0y_jr_{00}\beta b^4+2880r^i_0y_js_0\beta^2b^4+512r^i_0y_js_0b^6\beta^2-1440r^i_0b_jr_{00}b^2\beta^2-576r^i_0b_jr_{00}\beta^2b^4$$
$$-2880r^i_0b_js_0b^2\beta^3+2592\beta^2s^i_0y_js_0b^2+216\beta s^i_0y_jr_{00}b^2+216y^is_jr_{00}b^2\beta-2880y^is_js_0b^2\beta^2$$
$$+864y^is_jr_{00}\beta b^4+1152b^is_jr_{00}\beta^2b^4+1728b^is_js_0b^2\beta^3+3312b^is_jr_{00}b^2\beta^2-576b^ib_jr_{0m}s^m_0b^2\beta^3$$
$$-2208g^iy_jr_{00}b^2\beta^2-512g^iy_jr_{00}b^6\beta^2+512b^ir_{j0}s_0\beta^3b^4-2048b^ir_{j0}s_0b^5\beta^3-2496\delta^i_jr_{00}s_0b^4\beta^2$$
$$+2304\delta^i_jr_{00}r_0b^5\beta^2+576y^is_jr_{00}\beta b^6+576y^ib_js_ms^m_0b^2\beta^3-576b^ib_jr_{00|0}b^4\beta^2+4864\delta^i_jr_0s_0b^2\beta^3$$
$$+6656\delta^i_jr_0s_0b\beta^3+9728\delta^i_jr_0s_0b^3\beta^3+2304\delta^i_jr_{00}s_0b^5\beta^2+2048\delta^i_jr_0s_0b^5\beta^3+48y^iy_js_{0|0}b^4\beta$$
$$+512b^iy_js_{0|0}\beta^2b^6-13312y^ir_js_0b\beta^3-256b^iy_js^2_0b^2\beta^2-6080b^iy_js^2_0b\beta^2-9728b^iy_js^2_0b^3\beta^2$$
$$-1200b^iy_jr_{0m}s^m_0b^2\beta^2-1728b^iy_jr_{0m}s^m_0b^4\beta^2+3216b^iy_js_{0|0}b^2\beta^2+2880b^iy_js_{0|0}b^4\beta^2+120b^ib_jr^2_{00}b^2\beta$$
$$+6480b^ib_jr_{00}s_0\beta^2+512b^ir_{j0}r_0b^4\beta^3-2048b^ir_{j0}r_0b^5\beta^3+8576b^is_jr_{00}b\beta^3+11264b^is_jr_{00}b^3\beta^3$$
$$+2048b^is_jr_{00}b^5\beta^3+4864y^ir_js_0b^2\beta^3+960y^ib_js^2_0b^2\beta^2-7104y^ib_js^2_0b\beta^2+720b^ib_jr_{00}r_0\beta^2$$
$$-1440b^ib_jr_{00|0}b^2\beta^2-2304g^iy_jr_{00}\beta^2b^4+2048y^is_jr_0b^5\beta^3+64y^iy_js_{0|0}\beta b^6+1088y^iy_jr_{0m}s^m_0b^6\beta$$
$$+1104y^ib_js_{0|0}b^2\beta^2+384y^ib_js_{0|0}b^4\beta^2-2048y^is_js_0b^5\beta^3-512y^is_jr_0b^4\beta^3+228y^ib_jr_{00}r_0\beta$$
$$-264y^ib_jr_{00|0}b^2\beta-11264b^ir_{j0}r_0b^3\beta^3-24b^iy_jr_{00}r_0\beta+1152y^iy_jr_{0m}s^m_0b^2\beta+1968y^iy_jr_{0m}s^m_0b^4\beta$$
$$+184y^iy_jr_{00}s_0b^4-64y^iy_jr_{00}s_0b^5-32y^iy_jr_{00}r_0b^4-64y^iy_jr_{00}r_0b^5+1464y^iy_js_ms^m_0b^2\beta^2$$
$$+1920y^iy_js_ms^m_0b^4\beta^2-256y^iy_js^2_0b^5\beta-32y^iy_js^2_0b^4\beta-624y^ib_jr_{00|0}b^4\beta-8576b^ir_{j0}s_0b\beta^3$$
$$-768b^ir_{j0}r_{00}b^2\beta^2-1728y^ir_{j0}s_0\beta^2b^4+4608y^ir_{j0}s_0b^5\beta^2-1152y^ir_{j0}r_0b^4\beta^2+4608y^ir_{j0}r_0b^5\beta^2$$
$$++2112\delta^i_jr_{00}r_0b^2\beta^2+1680\delta^i_jr_{00}r_0b\beta^2-488y^iy_js^2_0b^2\beta+128y^iy_js^2_0b\beta+128y^iy_js^2_0b^3\beta-392y^iy_jr_0s_0\beta$$
$$-4608y^is_jr_{00}b^5\beta^2-8576b^ir_{j0}r_0b\beta^3+1856b^ir_{j0}s_0b^2\beta^3-11264b^ir_{j0}s_0b^3\beta^3+2816b^ir_{j0}r_0b^2\beta^3$$
$$+4224\delta^i_jr_{00}r_0b^3\beta^2+512y^iy_js_ms^m_0b^6\beta^2+8448y^ir_{j0}s_0b^3\beta^2+8448y^ir_{j0}r_0b^3\beta^2-19456y^ir_js_0b^3\beta^3$$
$$+1024y^ir_js_0\beta^3b^4-4096y^ir_js_0b^5\beta^3-2784\delta^i_jr_{00}s_0b^2\beta^2+1680\delta^i_jr_{00}s_0b\beta^2+4224\delta^i_jr_{00}s_0b^3\beta^2$$

$$-3360y^i s_j r_{00} b\beta^2 - 2880b^i b_j s_{0|0} b^2\beta^3 - 1536y^i b_j r_{0m} s_0^m b^6\beta^2 - 384y^i b_j r_{00|0} b^6\beta - 5424y^i b_j r_{0m} s_0^m b^2\beta^2$$
$$-6720y^i b_j r_{0m} s_0^m b^4\beta^2 - 16y^i y_j r_{00} s_0 b + 100y^i y_j r_{00} s_0 b^2 - 64y^i y_j r_{00} s_0 b^3 - 16y^i y_j r_{00} r_0 b$$
$$-32y^i y_j r_{00} r_0 b^2 - 64y^i y_j r_{00} r_0 b^3 - 6656y^i s_j s_0 b\beta^3 + 6656y^i s_j r_0 b\beta^3 - 9728y^i s_j s_0 b^3\beta^3 - 12864\overline{R}^i_j\beta^3 b^4$$
$$-2432y^i s_j r_0 b^2\beta^3 + 9728y^i s_j r_0 b^3\beta^3 - 144y^i b_j r_{00} s_0\beta - 6144y^i b_j s_0^2 b^3\beta^2 + 2160y^i b_j r_0 s_0\beta^2$$
$$+48b^i y_j r_{00|0} b^2\beta + 48b^i y_j r_{00|0} b^4\beta - 4608y^i r_j r_{00} b^5\beta^2 + 512b^i y_j r_0 s_0\beta^2 + 2880b^i y_j s_m s_0^m b^2\beta^3$$
$$+1152g^i b_j r_{00}\beta^3 b^2 + 8576b^i r_j r_{00} b\beta^3 - 1152g^i y_j s_0 b^2\beta^3 - 8448y^i s_j r_{00} b^3\beta^2 + 6912b^i b_j s_0^2 b\beta^3$$
$$+2304b^i s_j s_0 b\beta^4 - 2304b^i s_j r_0 b\beta^4 - 2112y^i r_{j0} r_0\beta^2 b^2 + 1152\delta^i_j r_{00} r_0 b^4\beta^2 + 1024\delta^i_j r_0 s_0 b^4\beta^3$$
$$+3360y^i r_{j0} s_0 b\beta^2 + 3360y^i r_{j0} r_0 b\beta^2 - 108y^i r_{j0} r_{00} b^2\beta - 2448y^i r_{j0} s_0 b^2\beta^2 - 192y^i r_{j0} r_{00}\beta b^4$$
$$-2048b^i y_j s_0^2 b^5\beta^2 + 512b^i y_j s_0^2 b^4\beta^2 + 2048b^i r_j r_{00} b^5\beta^3 + 4608b^i r_j s_0 b\beta^4 + 2112y^i r_j r_{00} b^2\beta^2$$
$$-3360y^i r_j r_{00} b\beta^2 - 8448y^i r_j r_{00} b^3\beta^2 + 1152y^i r_j r_{00}\beta^2 b^4 - 48b^i y_j r_{00} s_0\beta - 512b^i y_j r_{0m} s_0^m b^6\beta^2$$
$$-2816b^i r_j r_{00}\beta^3 b^2 - 512b^i r_j r_{00}\beta^3 b^4 + 11264b^i r_j r_{00} b^3\beta^3 + 1728r_0^i s_j b^2\beta^4 + 952r_0^i y_j s_0\beta^2$$
$$+12r_0^i y_j r_{00}\beta - 2736r_0^i b_j s_0\beta^3 - 684r_0^i b_j r_{00}\beta^2 + 36\beta s_0^i y_j r_{00} + 648\beta^2 s_0^i y_j s_0 + 6432r_0^i r_{j0} b^2\beta^3$$
$$+4224r_0^i r_{j0}\beta^3 b^4 + 512r_0^i r_{j0} b^6\beta^3 - 1152y^i s_j s_0\beta^2 b^4 - 1296s_k^i s_0^k y_j\beta^3 + 1728r_0^i s_j\beta^4 + 648s_k^i s_0^k b_j\beta^4$$
$$-3230560s_0^i s_{0j} b^2\beta^3 - 4257984s_0^i s_{0j}\beta^3 b^4 - 2336\overline{R}^i_j\beta^3 - 9760\overline{R}^i_j\beta^3 b^2 - 5632\overline{R}^i_j\beta^3 b^6 - 512\overline{R}^i_j\beta^3 b^8$$

$$t_9 := -432s^i s_j\beta^4 - 1188s_k^i s_j^k\beta^4 + 182712s_0^i s_{0j}\beta^2 + 3\delta^i_j r_{00}^2 + 1488s^i_{j|0}\beta^3 - 2976s^i_{0|j}\beta^3 + 396s_0^i b_j r_{00}\beta$$
$$+254208s_0^i s_{0j}\beta^2 b^8 - 744r_0^i r_{j0}\beta^2 + 744r_j^i r_{00}\beta^2 + 2088\delta^i_j s_m s_0^m\beta^3 + 5472s^i_{j|0} b^2\beta^3 - 476y^i r_{k0} s_j^k\beta^2$$
$$+744b^i r_{00|j}\beta^2 - 624s^i_{0|0} b_j\beta^2 + 432b^i s_m s_0^m\beta^4 + 1368b^i r_{k0} s_j^k\beta^3 + 38\delta^i_j r_{00|0}\beta + 952y^i r_{jk} s_0^k\beta^2$$
$$+476y^i s_{j|0}\beta^2 + 80s^i_{0|0} y_j\beta + 36\delta^i_j r_{00}^2 b^4 + 24\delta^i_j r_{00}^2 b^2 - 952y^i s_{0|j}\beta^2 + 2736b^i s_{0|j}\beta^3 - 1044y^i s_m s_0^m\beta^3$$
$$-10944s^i_{0|j} b^2\beta^3 - 12y^i y_j r_{0m} s_0^m + 12y^i y_j s_0^2 - 72b^i b_j r_{00}^2 + 2y^i b_j r_{00|0} - 1368b^i s_{j|0}\beta^3 + 2736r_j^i s_0\beta^3$$
$$-76y^i r_{00|j}\beta + 76y^i r_{j0|0}\beta - 3072s^i_{0|j} b^6\beta^3 - 744b^i r_{j0|0}\beta^2 - 452\delta^i_j s_0^2\beta^2 + 5760s^i_{j|0}\beta^3 b^4 + 1536s^i_{j|0} b^6\beta^3$$
$$-2736b^i r_{jk} s_0^k\beta^3 - 1368s^i r_{j0}\beta^3 - 11520s^i_{0|j}\beta^3 b^4 + 952\delta^i_j r_{0m} s_0^m\beta^2 + 476\delta^i_j s_{0|0}\beta^2 + 228y^i s_j s_0\beta$$
$$+144b^i b_j r_{00|0}\beta - 3120b^i b_j s_0^2\beta^2 + 1296b^i b_j s_m s_0^m\beta^3 + 1056b^i b_j r_{0m} s_0^m\beta^2 + 1608b^i b_j s_{0|0}\beta^2$$
$$-144y^i s_j r_{00} b^6 + 200y^i b_j r_{0m} s_0^m\beta - 1280y^i s_{0|j}\beta^2 b^6 + 24b^i r_{j0} s_0\beta^2 - 80y^i b_j s_{0|0}\beta - 2736b^i r_{j0|0} b^2\beta^2$$
$$+24y^i y_j r_0 s_0 - 20y^i b_j r_{00} s_0 - 60y^i y_j s_m s_0^m\beta + 1408s^i_{0|0} y_j\beta b^6 + 512s^i_{0|0} y_j\beta b^8 + 24y^i r_{j0} r_{00} b^4$$
$$-2880b^i s_{j|0} b^2\beta^3 - 1152b^i s_{j|0}\beta^3 b^4 + 5760b^i s_{0|j} b^2\beta^3 + 1632b^i s_j s_0\beta^3 + 1380b^i s_j r_{00}\beta^2 - 2880s^i_{0|0} b_j b^2\beta^2$$
$$-4032s^i_{0|0} b_j\beta^2 b^4 - 1536s^i_{0|0} b_j\beta^2 b^6 - 36b^i b_j r_{00}^2 b^2 + 312s^i y_j s_0\beta^2 + 108s^i y_j r_{00}\beta - 128\delta^i_j r_{00} r_0\beta$$
$$+192\delta^i_j r_{00|0} b^2\beta + 312\delta^i_j r_{00|0} b^4\beta + 352\delta^i_j s_0^2 b^2\beta^2 + 12y^i r_{j0} r_{00} b^2 + 1848y^i s_{j|0} b^2\beta^2 + 2304r_j^i s_0\beta^3 b^4$$
$$+1920b^i r_j s_0\beta^3 - 20y^i b_j r_{00} r_0 - 912b^i r_{j0} r_0\beta^2 + 144b^i r_{j0} r_{00}\beta - 3696y^i s_{0|j} b^2\beta^2 - 4224y^i s_{0|j}\beta^2 b^4$$
$$-276s^i b_j r_{00}\beta^2 + 2736r_j^i r_{00} b^2\beta^2 + 768r_j^i r_{00} b^6\beta^2 + 2880r_j^i r_{00}\beta^2 b^4 - 24y^i y_j s_0^2 b^2 - 144y^i y_j r_{0m} s_0^m b^4$$
$$-72y^i y_j r_{0m} s_0^m b^2 - 36b^i y_j r_{00} s_0 - 960b^i s_j r_0\beta^3 - 2448y^i s_m s_0^m b^2\beta^3 - 1232\delta^i_j r_0 s_0\beta^2 + 4896\delta^i_j s_m s_0^m b^2\beta^3$$
$$+3696\delta^i_j r_{0m} s_0^m b^2\beta^2 + 4224\delta^i_j r_{0m} s_0^m b^4\beta^2 + 1848\delta^i_j s_{0|0} b^2\beta^2 + 2112\delta^i_j s_{0|0} b^4\beta^2 + 104y^i r_{j0} s_0\beta$$
$$+128y^i r_{j0} r_0\beta + 912b^i r_j r_{00}\beta^2 - 1232y^i r_j s_0\beta^2 - 128y^i r_j r_{00}\beta + 72y^i b_j r_{00|0} b^4 + 24y^i b_j r_{00|0} b^2$$
$$-5760b^i r_{jk} s_0^k b^2\beta^3 - 2880b^i r_{j0|0}\beta^2 b^4 - 768b^i r_{j0|0}\beta^2 b^6 + 2736b^i r_{00|j} b^2\beta^2 + 2880b^i r_{00|j}\beta^2 b^4$$
$$+768b^i r_{00|j}\beta^2 b^6 - 832y^i s_j s_0\beta^2 - 140y^i s_j r_{00}\beta - 384y^i r_{00|j} b^2\beta - 624y^i r_{00|j}\beta b^4 - 320y^i r_{00|j}\beta b^6$$
$$+384y^i r_{j0|0} b^2\beta + 624y^i r_{j0|0}\beta b^4 + 320y^i r_{j0|0}\beta b^6 - 1848y^i r_{k0} s_j^k b^2\beta^2 - 2112y^i r_{k0} s_j^k\beta^2 b^4$$
$$-640y^i r_{k0} s_j^k\beta^2 b^6 + 3696y^i r_{jk} s_0^k b^2\beta^2 + 4224y^i r_{jk} s_0^k\beta^2 b^4 + 1280y^i r_{jk} s_0^k\beta^2 b^6 - 96y^i y_j s_0^2 b^4$$
$$-96y^i y_j r_{0m} s_0^m b^6 - 1152y^i s_m s_0^m\beta^3 b^4 + 640\delta^i_j s_{0|0}\beta^2 b^6 + 1280\delta^i_j r_{0m} s_0^m b^6\beta^2 + 160\delta^i_j r_{00|0} b^6\beta$$
$$-2560\delta^i_j s_0^2 b^5\beta^2 + 640\delta^i_j s_0^2 b^4\beta^2 + 2304\delta^i_j s_m s_0^m b^4\beta^3 + 40\delta^i_j r_{00} s_0\beta - 2464\delta^i_j s_0^2 b\beta^2 - 5632\delta^i_j s_0^2 b^3\beta^2$$
$$+188y^i b_j s_0^2\beta + 64y^i b_j r_{00|0} b^6 + 2304b^i s_{0|j}\beta^3 b^4 - 2304b^i r_{jk} s_0^k\beta^3 b^4 + 616y^i s_j r_0\beta^2 - 2880s^i r_{j0} b^2\beta^3$$
$$+5760r_j^i s_0 b^2\beta^3 + 144b^i y_j s_0^2\beta - 888b^i y_j s_m s_0^m\beta^2 + 72b^i y_j r_{0m} s_0^m\beta - 144b^i y_j s_{0|0}\beta - 336y^i b_j s_m s_0^m\beta^2$$

$$-1152s^ir_{j0}\beta^3b^4+2880b^ir_{k0}s_j^kb^2\beta^3+1152b^ir_{k0}s_j^k\beta^3b^4+2112y^is_{j|0}\beta^2b^4+640y^is_{j|0}\beta^2b^6$$
$$+544s^i_{0|0}y_jb^2\beta+1344s^i_{0|0}y_j\beta b^4+552\overline{R}^i_j\beta^2+2976\overline{R}^i_j\beta^2b^2+5472\overline{R}^i_j\beta^2b^4+3840\overline{R}^i_j\beta^2b^6$$
$$+768\overline{R}^i_j\beta^2b^8+3552b^ib_js_{0|0}b^2\beta^2+1536b^ib_js_{0|0}b^4\beta^2+128y^ib_js_{0|0}\beta b^6+3072b^iy_jr_0s_0b^3\beta$$
$$-512y^ib_jr_0s_0b^5\beta-1408y^ib_jr_0s_0b^4\beta-576b^ib_jr_{00}s_0b^4\beta+384b^ib_jr_0s_0b^2\beta^2-8832b^ib_jr_0s_0b\beta^2$$
$$-6144b^ib_jr_0s_0b^3\beta^2-1984y^ib_jr_0s_0b^2\beta+1600y^ib_jr_0s_0b\beta+1792y^ib_jr_0s_0b^3\beta-2304b^ib_jr_{00}r_0b^3\beta$$
$$-288b^ib_jr_{00}r_0b^2\beta-1728b^ib_jr_{00}r_0b\beta-1728b^ib_jr_{00}s_0b\beta-2304b^ib_jr_{00}s_0b^3\beta-384b^iy_jr_0s_0b^4\beta$$
$$-2160b^ib_jr_{00}s_0b^2\beta+1536b^iy_jr_0s_0b^5\beta-480b^iy_jr_0s_0b^2\beta+1152b^iy_jr_0s_0b\beta+1536s^i_ks^k_0y_j\beta^2b^6$$
$$+1944s^i_0b_js_0\beta^2+2016s^i_ks^k_0y_jb^2\beta^2+3168s^i_ks^k_0y_j\beta^2b^4-864\beta s^i_0y_js_0b^4-576\beta s^i_0y_js_0b^6$$
$$-432\beta s^i_0y_js_0b^21728s^i_0b_jr_{00}b^2\beta+3888s^i_0b_js_0b^2\beta^2+2160s^i_0b_jr_{00}\beta b^4+576s^i_0b_jr_{00}\beta b^6$$
$$-672r^i_0y_js_0b^2\beta-960r^i_0y_js_0\beta b^4-384r^i_0y_js_0b^6\beta+432r^i_0b_jr_{00}b^2\beta+3552r^i_0b_js_0b^2\beta^2+288r^i_0b_jr_{00}\beta b^4$$
$$+1536r^i_0b_js_0\beta^2b^4+1408y^ib_jr_{0m}s^m_0b^6\beta+2784y^ib_jr_{0m}s^m_0b^4\beta-144y^ib_js_{0|0}b^2\beta+96y^iy_jr_0s_0b^2$$
$$-332y^is_jr_{00}b^2\beta-1312y^is_js_0b^2\beta^2-176y^is_jr_{00}\beta b^4+1408y^is_jr_0\beta^2b^2+5632y^is_js_0b^3\beta^2$$
$$-5632y^is_jr_0b^3\beta^2+1792y^ib_js^2_0b^3\beta-568y^ib_jr_0s_0\beta-144b^iy_jr_0s_0\beta-2544b^iy_js_ms^m_0b^2\beta^2$$
$$-1536b^iy_js_ms^m_0b^4\beta^2+768b^is_jr_{00}\beta^2b^4+960b^is_js_0b^2\beta^3-1248s^ib_jr_{00}b^2\beta^2-960s^ib_jr_{00}\beta^2b^4$$
$$+1920b^ir_jr_{00}b^2\beta^2-3648b^ir_jr_{00}b\beta^2-7680b^ir_jr_{00}b^3\beta^2+960s^iy_js_0\beta^2b^4+2352b^is_jr_{00}b^2\beta^2$$
$$-6144b^ib_js^2_0b^3\beta^2-96b^ib_jr_0s_0\beta^2-3072b^is_js_0b^3\beta^3-768b^is_jr_0b^2\beta^3+3072b^is_jr_0b^3\beta^3-3840b^is_js_0b\beta^3$$
$$+3840b^is_jr_0b\beta^3-320\delta^i_jr_{00}r_0b^4\beta-2560\delta^i_jr_0s_0b^5\beta^2-1280\delta^i_jr_0s_0b^4\beta^2+584y^ir_{j0}s_0b^2\beta-512y^ir_{j0}s_0b\beta$$
$$-1664y^ir_{j0}s_0b^3\beta+416y^ir_{j0}r_0b^2\beta-512y^ir_{j0}r_0b\beta-1664y^ir_{j0}r_0b^3\beta+608y^ir_{j0}s_0\beta b^4+192b^iy_js^2_0b^4\beta$$
$$-7680b^ir_js_0b\beta^3+1536b^ir_js_0b^2\beta^3-6144b^ir_js_0b^3\beta^3+512y^ir_jr_{00}b\beta+1664y^ir_jr_{00}b^3\beta+4928y^ir_js_0b\beta^2$$
$$-416y^ir_jr_{00}b^2\beta-2816y^ir_js_0b^2\beta^2-320y^ir_jr_{00}\beta b^4+1280y^ir_jr_{00}b^5\beta-384b^iy_js_{0|0}\beta b^6$$
$$+384b^iy_jr_{0m}s^m_0b^6\beta+1536b^iy_js^2_0b^5\beta+768b^ir_jr_{00}\beta^2b^4-2880r^i_0s_jb^2\beta^3-1152r^i_0s_j\beta^3b^4$$
$$-144r^i_0y_js_0\beta+1608r^i_0b_js_0\beta^2+144r^i_0b_jr_{00}\beta-72\beta s^i_0y_js_0-1728s^i_ks^k_0b_jb^2\beta^3-2736r^i_0r_{j0}b^2\beta^2$$
$$-2880r^i_0r_{j0}\beta^2b^4-768r^i_0r_{j0}\beta^2b^6+432y^is_js_0b^2\beta-144y^is_js_0\beta b^4-576b^is_js_0\beta^2b^4-1152b^is_jr_{00}b^2\beta$$
$$-4464b^is_js_0b^2\beta^2-720b^is_jr_{00}\beta b^4+1056b^ib_jr_{0m}s^m_0b^2\beta^2-448y^is_js_0\beta^2b^4-192y^is_js_0b^6\beta$$
$$++528s^iy_jr_{00}b^2\beta-768b^ir_{j0}s_0\beta^2b^4+3072b^ir_{j0}s_0b^5\beta^2-768b^ir_{j0}r_0b^4\beta^2-224y^ib_jr_{00}s_0b^4$$
$$-256y^ib_jr_{00}s_0b^5-128y^ib_jr_{00}r_0b^4-256y^ib_jr_{00}r_0b^5+32y^ib_jr_{00}s_0b368y^ib_jr_{00}s_0b^2-64y^ib_jr_{00}s_0b^3$$
$$+32y^ib_jr_{00}r_0b-104y^ib_jr_{00}r_0b^2-64y^ib_jr_{00}r_0b^3-640\delta^i_jr_{00}r_0b^5\beta+1280y^is_jr_{00}b^5\beta-48y^ib_js_ms^m_0b^2\beta^2$$
$$+384y^ib_js_ms^m_0b^4\beta^2+1440y^ib_jr_{0m}s^m_0b^2\beta+960b^ib_js^2_0b^2\beta^2-8832b^ib_js^2_0b\beta^2-2816\delta^i_jr_0s_0b^2\beta^2$$
$$-2464\delta^i_jr_0s_0b\beta^2-5632\delta^i_jr_0s_0b^3\beta^2-640\delta^i_jr_{00}s_0b^5\beta+832\delta^i_jr_{00}s_0b^4\beta+11264y^ir_js_0b^3\beta^2+96b^iy_js^2_0b^2\beta$$
$$+1152b^iy_js^2_0b\beta+3072b^iy_js^2_0b^3\beta+384b^iy_jr_{0m}s^m_0b^2\beta+672b^iy_jr_{0m}s^m_0b^4\beta-672b^iy_js_{0|0}b^2\beta$$
$$-960b^iy_js_{0|0}b^4\beta-2808b^ib_jr_{00}s_0\beta+3072b^ir_{j0}r_0b^5\beta^2-3648b^is_jr_{00}b\beta^2-7680b^is_jr_{00}b^3\beta^2$$
$$-3072b^is_jr_{00}b^5\beta^2-1312y^ib_js^2_0b^2\beta+1600y^ib_js^2_0b\beta-216b^ib_jr_{00}r_0\beta+432b^ib_jr_{00|0}b^2\beta+288b^ib_jr_{00|0}b^4\beta$$
$$+1104s^iy_js_0b^2\beta^2+816s^iy_jr_{00}\beta b^4+384s^iy_jr_{00}\beta b^6+96y^ib_js_{0|0}b^4\beta+2560y^is_js_0b^5\beta^2+640y^is_jr_0b^4\beta^2$$
$$-2560y^is_jr_0b^5\beta^2+96y^iy_jr_0s_0b^4-336y^iy_js_ms^m_0b^2\beta-624y^iy_js_ms^m_0b^4\beta-512y^ib_js^2_0b^5\beta-64y^ib_js^2_0b^4\beta$$
$$-1920b^ir_{j0}r_0\beta^2b^2+7680b^ir_{j0}s_0b^3\beta^2+3648b^ir_{j0}s_0b\beta^2+3648b^ir_{j0}r_0b\beta^2+216b^ir_{j0}r_{00}b^2\beta$$
$$-1056b^ir_{j0}s_0b^2\beta^2-416\delta^i_jr_{00}r_0b^2\beta-256\delta^i_jr_{00}r_0b\beta+7680b^ir_{j0}r_0b^3\beta^2-3072b^ir_jr_{00}b^5\beta^2$$
$$-832\delta^i_jr_{00}r_0b^3\beta-384y^iy_js_ms^m_0b^6\beta-1280y^ir_{j0}s_0b^5\beta+320y^ir_{j0}r_0b^4\beta-1280y^ir_{j0}r_0b^5\beta-72b^iy_jr_{00}s_0b^2$$
$$-1280y^ir_js_0\beta^2b^4+5120y^ir_js_0b^5\beta^2+640\delta^i_jr_{00}s_0b^2\beta-256\delta^i_jr_{00}s_0b\beta-832\delta^i_jr_{00}s_0b^3\beta+512y^is_jr_{00}b\beta$$
$$+1664y^is_jr_{00}b^3\beta+2464y^is_js_0b\beta^2-2464y^is_jr_0b\beta^2-384b^ib_jr_{0m}s^m_0b^4\beta^2+408s^i_ks^k_0y_j\beta^2$$
$$-1368r^i_0s_j\beta^3-864s^i_ks^k_0b_j\beta^3-1728s^i_ks^k_jb^2\beta^4+985056s^i_0s_{0j}b^2\beta^2+1811232s^i_0s_{0j}\beta^2b^4$$
$$+1271040s^i_0s_{0j}\beta^2b^6-144y^is_jr_{00}b^4-36y^is_jr_{00}b^2-2736b^is_js_0\beta^2-396b^is_jr_{00}\beta$$

$$
\begin{aligned}
t_{10} :=\ & 648s^is_j\beta^3+864s^i_ks^k_j\beta^3-23832s^i_0s_{0j}\beta-2\delta^i_jr_{00|0}-424s^i_{j|0}\beta^2+848s^i_{j|0}\beta^2+4y^ir_{00|j}-4s^i_{0|0}y_j\\
&-4y^ir_{j0|0}-36s^i_0b_jr_{00}+120r^i_0r_{j0}\beta-12y^is_js_0+36b^is_jr_{00}-712\delta^i_js_ms^m_0\beta^2+68y^ir_{k0}s^k_j\beta\\
&-120b^ir_{00|j}\beta+112s^i_{0|0}b_j\beta-648b^is_ms^m_0\beta^3-536b^ir_{k0}s^k_j\beta^2-136y^ir_{jk}s^k_0\beta-68y^is_{j|0}\beta\\
&-24\delta^i_jr_{00|0}b^4-12\delta^i_jr_{00|0}b^2+136y^is_{0|j}\beta+356y^is_ms^m_0\beta^2-2144s^i_{j|0}b^2\beta^2-64s^i_{0|0}y_jb^8\\
&-128s^i_{0|0}y_jb^6-4\delta^i_jr_{00}s_0+8\delta^i_jr_{00}r_0-16\delta^i_jr_{00|0}b^6-96s^i_{0|0}y_jb^4-32s^i_{0|0}y_jb^2-8s^iy_jr_{00}+8y^ir_jr_{00}\\
&-8y^ir_{j0}s_0-8y^ir_{j0}r_0+48y^ir_{00|j}b^4+24y^ir_{00|j}b^2+32y^ir_{00|j}b^6-48y^ir_{j0|0}b^4-24y^ir_{j0|0}b^2\\
&-32y^ir_{j0|0}b^6+7104s^i_{j|0}\beta^2b^4-12b^ir_{j0}r_{00}+8y^is_jr_{00}+4y^iy_js_ms^m_0-8b^iy_jr_{0m}s^m_0+8b^iy_js_{0|0}\\
&+40b^iy_js^2_0-12b^ib_jr_{00|0}-16y^ib_jr_{0m}s^m_0+4y^ib_js_{0|0}+20y^ib_js^2_0+536b^is_{j|0}\beta^2-1072r^i_js_0\beta^2\\
&-120r^i_jr_{00}\beta+4096s^i_{j|0}\beta^2b^6+512s^i_{j|0}\beta^2b^8+120b^ir_{j0|0}\beta+80\delta^i_js^2_0\beta-1072b^is_{0|j}\beta^2\\
&-3552s^i_{j|0}\beta^2b^4-2048s^i_{j|0}\beta^2b^6-256s^i_{j|0}\beta^2b^8+4288s^i_{j|0}b^2\beta^2+1072b^ir_{jk}s^k_0\beta^2+536s^ir_{j0}\beta^2\\
&-136\delta^i_jr_{0m}s^m_0\beta-68\delta^i_js_{0|0}\beta+144y^is_js_0b^4+864b^is_js_0\beta+144b^is_jr_{00}b^2+144b^is_jr_{00}b^4-576b^ir_{00|j}b^2\beta\\
&-864b^ir_{00|j}\beta b^4-384b^ir_{00|j}\beta b^6+136y^is_js_0\beta-80s^iy_js_0\beta+336y^ir_{k0}s^k_jb^2\beta+528y^ir_{k0}s^k_j\beta b^4\\
&+256y^ir_{k0}s^k_j\beta b^6-672y^ir_{jk}s^k_0b^2\beta-1056y^ir_{jk}s^k_0\beta b^4-512y^ir_{jk}s^k_0\beta b^6-32y^ir_jr_{00}b+32y^ir_jr_{00}b^2\\
&-128y^ir_jr_{00}b^3+32y^ir_jr_{00}b^4-128y^ir_jr_{00}b^5+32y^iy_js_ms^m_0b^6+416y^ib_js^2_0b^2+1248y^is_ms^m_0\beta^2b^4\\
&+256y^is_ms^m_0\beta^2b^6-256\delta^i_js_{0|0}\beta b^6-512\delta^i_jr_{0m}s^m_0b^6\beta+1024\delta^i_js^2_0b^5\beta-352\delta^i_js^2_0b^4\beta-512\delta^i_js_ms^m_0b^6\beta^2\\
&+448\delta^i_js^2_0b\beta+1408\delta^i_js^2_0b^3\beta+320y^ib_js^2_0b^4+56y^ib_jr_0s_0-512b^is_{0|j}\beta^2b^6-864b^is_ms^m_0b^2\beta^3\\
&+1536s^ir_{j0}\beta^2b^4+512b^ir_{jk}s^k_0\beta^2b^6+1776s^ir_{j0}b^2\beta^2-1776b^ir_{k0}s^k_jb^2\beta^2-32y^is_jr_{00}b-112y^is_jr_0\beta\\
&-128y^ib_js^2_0b^3-3072r^i_js_0\beta^2b^4+152b^iy_js_ms^m_0\beta+40y^ib_js_ms^m_0\beta+256s^ir_{j0}\beta^2b^6-72s^ib_js_0\beta^2\\
&-1536b^ir_{k0}s^k_j\beta^2b^4-256y^is_{j|0}\beta b^6+1024b^ib_jr_0s_0b^5\beta-256b^ib_jr_0s_0b^4\beta+3712b^ib_jr_0s_0b\beta\\
&+5632b^ib_jr_0s_0b^3\beta-256b^ib_jr_0s_0b^2\beta-256s^i_ks^k_0y_j\beta b^8-648s^i_0b_js_0\beta-416s^i_ks^k_0y_jb^2\beta-960s^i_ks^k_0y_j\beta b^4\\
&-896s^i_ks^k_0y_j\beta b^6-72\overline{R}^i_j\beta-1152\overline{R}^i_j\beta b^4-1152\overline{R}^i_j\beta b^6-480\overline{R}^i_j\beta b^2-384\overline{R}^i_j\beta b^8-2592s^i_0b_js_0b^2\beta\\
&-2592s^i_0b_js_0\beta b^4-1440r^i_0b_js_0b^2\beta-1344r^i_0b_js_0\beta b^4-256r^i_0b_js_0b^6\beta+408b^ib_jr_{00}s_0+24b^ib_jr_{00}r_0\\
&-48b^ib_jr_{00|0}b^4-48b^ib_jr_{00|0}b^2-64y^ib_js_{0|0}b^6-160\delta^i_js^2_0b^2\beta-256b^iy_js^2_0b^5+64b^iy_js_{0|0}b^6+16b^iy_jr_0s_0\\
&+64b^iy_js^2_0b^4-64b^iy_jr_{0m}s^m_0b^6-64b^iy_js^2_0b+112b^iy_js^2_0b^2-256b^iy_js^2_0b^3-96b^iy_jr_{0m}s^m_0b^4\\
&-48b^iy_jr_{0m}s^m_0b^2+48b^iy_js_{0|0}b^2+96b^iy_js_{0|0}b^4+32y^ir_{j0}s_0b-56y^ir_{j0}s_0b^2+128y^ir_{j0}s_0b^3\\
&+32y^ir_{j0}r_0b-32y^ir_{j0}r_0b^2+128y^ir_{j0}r_0b^3-192b^ir_jr_{00}\beta-336y^is_{j|0}b^2\beta-528y^is_{j|0}\beta b^4-512r^i_js_0b^6\beta^2\\
&-1184b^ir_js_0\beta^2+192b^ir_{j0}r_0\beta-96s^iy_jr_{00}b^4-64s^iy_jr_{00}b^6+1056y^is_{0|j}\beta b^4+512y^is_{0|j}\beta b^6\\
&-576r^i_jr_{00}b^2\beta-3552r^i_js_0b^2\beta^2-864r^i_jr_{00}\beta b^4-384r^i_jr_{00}\beta b^6+24y^iy_js_ms^m_0b^2+48y^iy_js_ms^m_0b^4\\
&+592b^is_jr_0\beta^2+1272y^is_ms^m_0b^2\beta^2+224\delta^i_jr_0s_0\beta-2544\delta^i_js_ms^m_0b^2\beta^2-2496\delta^i_js_ms^m_0b^4\beta^2\\
&-672\delta^i_jr_{0m}s^m_0b^2\beta-1056\delta^i_jr_{0m}s^m_0b^4\beta-336\delta^i_js_{0|0}b^2\beta-528\delta^i_js_{0|0}b^4\beta+224y^ir_js_0\beta+56s^ib_jr_{00}\beta\\
&-128y^ib_js^2_0b+3072b^ir_{jk}s^k_0\beta^2b^4-256b^ir_{k0}s^k_j\beta^2b^6+3552b^ir_{jk}s^k_0b^2\beta^2+384b^ir_{j0|0}\beta b^6-216s^i_0b_jr_{00}b^2\\
&-432s^i_0b_jr_{00}b^4-288s^i_0b_jr_{00}b^6+1536r^i_0s_j\beta^2b^4+256r^i_0s_j\beta^2b^6-416r^i_0b_js_0\beta+1728s^i_ks^k_0b_jb^2\beta^2\\
&+1728s^i_ks^k_0b_j\beta^2b^4+48r^i_0y_js_0b^2+96r^i_0y_js_0b^4+64r^i_0y_js_0b^6-48r^i_0b_jr_{00}b^2-48r^i_0b_jr_{00}b^4\\
&+576r^i_0r_{j0}b^2\beta+864r^i_0r_{j0}\beta b^4+384r^i_0r_{j0}\beta b^6+1776r^i_0s_jb^2\beta^2+2592b^is_js_0b^2\beta+1728b^is_js_0\beta b^4\\
&-576b^ib_jr_{0m}s^m_0b^2\beta+192b^ib_jr_{0m}s^m_0b^4\beta-384s^iy_js_0b^2\beta+256y^ib_jr_0s_0b^5+320y^ib_jr_0s_0b^4\\
&+288b^ib_jr_{00}s_0b^4+192b^ib_jr_{00}s_0b+528b^ib_jr_{00}s_0b^2+384b^ib_jr_{00}s_0b^3-192y^ib_js_ms^m_0b^2\beta-128y^ib_jr_0s_0b\\
&-672y^ib_js_ms^m_0b^4\beta+1664b^ib_js^2_0b^2\beta+3712b^ib_js^2_0b\beta+704\delta^i_jr_0s_0b^2\beta+448\delta^i_jr_0s_0b\beta+1408\delta^i_jr_0s_0b^3\beta\\
&-2048y^ir_js_0b^5\beta-256b^ib_js_{0|0}\beta b^6+256b^ib_jr_{0m}s^m_0b^6\beta+1024b^ib_js^2_0b^5\beta-256b^ib_js^2_0b^4\beta+768b^is_jr_{00}b\beta\\
&+192b^ib_jr_{00}r_0b+48b^ib_jr_{00}r_0b^2+384b^ib_jr_{00}r_0b^3+2304b^is_jr_{00}b^3\beta+2368b^is_js_0b\beta^2-2368b^is_jr_0b\beta^2\\
&+1536b^is_jr_{00}b^5\beta+1024b^is_jr_0\beta^2b^2-576s^iy_js_0\beta b^4+272y^ib_jr_0s_0b^2-128y^ib_jr_0s_0b^3+1408y^is_jr_0b^3\beta
\end{aligned}
$$

$$-256y^ib_js_ms_0^mb^6\beta-1536b^ir_{j0}s_0b^5\beta+240b^ir_{j0}s_0b^2\beta-768b^ir_{j0}s_0b\beta-2304b^ir_{j0}s_0b^3\beta$$
$$+576b^ir_{j0}r_0b^2\beta-768b^ir_{j0}r_0b\beta-2304b^ir_{j0}r_0b^3\beta+384b^ir_{j0}s_0\beta b^4+384b^ir_{j0}r_0b^4\beta-1536b^ir_{j0}r_0b^5\beta$$
$$-2016b^ib_js_ms_0^mb^2\beta^2+64b^iy_jr_0s_0b^4-448y^is_js_0b\beta-1408y^is_js_0b^3\beta-352y^is_jr_0b^2\beta+448y^is_jr_0b\beta$$
$$-1440b^ib_js_{0|0}b^2\beta-1344b^ib_js_{0|0}b^4\beta-256b^iy_jr_0s_0b^5-64b^iy_jr_0s_0b+64b^iy_jr_0s_0b^2-256b^iy_jr_0s_0b^3$$
$$+232y^is_js_0b^2\beta+64y^is_js_0\beta b^4-1024y^is_js_0b^5\beta-256y^is_jr_0b^4\beta+1024y^is_jr_0b^5\beta+672b^iy_js_ms_0^mb^2\beta$$
$$+864b^iy_js_ms_0^mb^4\beta-256b^is_js_0\beta^2b^4+432s^ib_jr_{00}b^2\beta+288s^ib_js_0b^2\beta^2+768s^ib_jr_{00}\beta b^4+256s^ib_jr_{00}\beta b^6$$
$$+768b^ir_jr_{00}b\beta+2304b^ir_jr_{00}b^3\beta+4736b^ir_js_0b\beta^2-256s^iy_js_0b^6\beta-744b^is_jr_{00}b^2\beta-112\delta^i_jr_{00}s_0b^4$$
$$+5632b^ib_js_0^2b^3\beta+80b^ib_jr_0s_0\beta-4096b^is_jr_0b^3\beta^2+1024b^is_js_0b^5\beta^2+256b^is_jr_0b^4\beta^2-1024b^is_jr_0b^5\beta^2$$
$$+4096b^is_js_0b^3\beta^2+1024\delta^i_jr_0s_0b^5\beta+512\delta^i_jr_0s_0b^4\beta+256b^iy_js_ms_0^mb^6\beta+8192b^ir_js_0b^3\beta^2-512b^ir_js_0\beta^2b^4$$
$$+2048b^ir_js_0b^5\beta^2+704y^ir_js_0b^2\beta-896y^ir_js_0b\beta-2816y^ir_js_0b^3\beta+512y^ir_js_0\beta b^4-576b^ir_jr_{00}b^2\beta$$
$$-2048b^ir_js_0b^2\beta^2-384b^ir_jr_{00}\beta b^4+1536b^ir_jr_{00}b^5\beta-1408b^is_js_0b^2\beta^2-384b^is_jr_{00}\beta b^4-64s^i_ks^k_0y_j\beta$$
$$+536r^i_0s_j\beta^2+864s^is_jb^2\beta^3+432s^i_ks^k_0b_j\beta^2+2592s^i_ks^k_jb^2\beta^3+1728s^i_ks^k_j\beta^3b^4-158880s^i_0s_{0j}b^2\beta$$
$$-381312s^i_0s_{0j}\beta b^4-381312s^i_0s_{0j}\beta b^6-127104s^i_0s_{0j}\beta b^8+8r^i_0y_js_0-12r^i_0b_jr_{00}-24b^ir_{j0}r_{00}b^2$$
$$+2480b^ib_js_0^2\beta-1440b^ib_js_ms_0^m\beta^2-304b^ib_jr_{0m}s_0^m\beta-416b^ib_js_{0|0}\beta+192y^is_js_0b^6+8y^is_jr_{00}b^4$$
$$-48s^iy_jr_{00}b^2-48b^ir_{j0}s_0\beta-384y^ib_jr_{0m}s_0^mb^4-144y^ib_jr_{0m}s_0^mb^2-48y^ib_js_{0|0}b^4+20y^is_jr_{00}b^2$$
$$+16\delta^i_jr_{00}s_0b-64\delta^i_jr_{00}s_0b^2+64\delta^i_jr_{00}s_0b^3+16\delta^i_jr_{00}r_0b+32\delta^i_jr_{00}r_0b^2+256s^i_{0|0}b_j\beta b^8+1776b^is_{j|0}b^2\beta^2$$
$$+64\delta^i_jr_{00}r_0b^3+576b^ir_{j0|0}b^2\beta+864b^ir_{j0|0}\beta b^4+256y^ib_js_0^2b^5-320y^ib_jr_{0m}s_0^mb^6+672y^is_{0|j}b^2\beta$$
$$-80y^ir_{j0}s_0b^4+128y^ir_{j0}s_0b^5-32y^ir_{j0}r_0b^4+128y^ir_{j0}r_0b^5-128y^is_jr_{00}b^3-128y^is_jr_{00}b^5$$
$$+64\delta^i_jr_{00}s_0b^5+32\delta^i_jr_{00}r_0b^4+64\delta^i_jr_{00}r_0b^5+1536b^is_{j|0}\beta^2b^4+256b^is_{j|0}\beta^2b^6+1536s^i_{0|0}b_j\beta b^4$$
$$-3552b^is_{0|j}b^2\beta^2-3072b^is_{0|j}\beta^2b^4-1144b^is_js_0\beta^2-312b^is_jr_{00}\beta+704s^i_{0|0}b_jb^2\beta+1280s^i_{0|0}b_j\beta b^6$$

$$t_{11}:=4s^i_ks^k_0y_j+31776s^i_0s_{0j}b^4+10592s^i_0s_{0j}b^2-360s^is_j\beta^2-312s^i_ks^k_j\beta^2+21184s^i_0s_{0j}b^8+42368s^i_0s_{0j}b^6$$
$$-8r^i_0r_{j0}-4y^ir_{k0}s^k_j-8s^i_{0|0}b_j+8\delta^i_jr_{0m}s_0^m+4\delta^i_js_{0|0}-4\delta^i_js_0^2-8y^is_{0|j}-8b^ir_{j0|0}+8b^ir_{00|j}+64s^i_{0|j}\beta$$
$$-128s^i_{j0}\beta+4y^is_{0|j}+8y^ir_{kj}s^k_0+8r^i_jr_{00}+96s^i_ks^k_0y_jb^4+32s^i_ks^k_0y_jb^2+64s^i_ks^k_0y_jb^8+128s^i_ks^k_0y_jb^6$$
$$+72s^i_0b_js_0+32\overline{R}^i_jb^2+64\overline{R}^i_jb^8+96\overline{R}^i_jb^4+128\overline{R}^i_jb^6-96b^is_js_0+120\delta^i_js_ms_0^m\beta+360b^is_ms_0^m\beta^2$$
$$+104b^ir_{k0}s^k_j\beta+64\delta^i_jr_{0m}s_0^mb^6-32\delta^i_js_0^2b+208b^is_{0|j}\beta-60y^is_ms_0^m\beta+960s^i_{0|j}\beta b^4-128\delta^i_js_0^2b^5$$
$$+32\delta^i_js_{0|0}b^6-16\delta^i_jr_0s_0+80\delta^i_js_0^2b^4-24y^ir_{k0}s^k_jb^2-32y^ir_{k0}s^k_jb^6+96y^ir_{kj}s^k_0b^4+48y^ir_{kj}s^k_0b^2$$
$$+64y^ir_{kj}s^k_0b^6+48y^is_{0|j}b^4+24y^is_{0|j}b^2+32y^is_{0|j}b^6+64b^ir_{00|j}b^6-8y^is_js_0+8s^iy_js_0+28b^is_jr_{00}$$
$$-192s^i_{0|0}b_jb^4-64s^i_{0|0}b_jb^2-128s^i_{0|0}b_jb^8-256s^i_{0|0}b_jb^6-4s^ib_jr_{00}+48r^i_jr_{00}b^2+96r^i_jr_{00}b^4$$
$$+64r^i_jr_{00}b^6+16b^ir_jr_{00}-16y^ir_js_0-128\delta^i_js_0^2b^3+96\delta^i_jr_{0m}s_0^mb^4+48\delta^i_jr_{0m}s_0^mb^2+24\delta^i_js_{0|0}b^2$$
$$+48\delta^i_js_{0|0}b^4-48y^ir_{k0}s^k_jb^4-1920s^i_{j0}\beta b^4-1792s^i_{j0}\beta b^6-512s^i_{j0}\beta b^8-96y^is_{0|j}b^4-48y^is_{0|j}b^2$$
$$-64y^is_{0|j}b^6+8b^ir_{j0}s_0-16b^ir_{j0}r_0+8y^is_jr_0-8b^iy_js_ms_0^m+32b^ib_jr_{0m}s_0^m+40b^ib_js_{0|0}-496b^ib_js_0^2$$
$$-96b^ir_{j0|0}b^4-48b^ir_{j0|0}b^2-64b^ir_{j0|0}b^6+96b^ir_{00|j}b^4+48b^ir_{00|j}b^2-104b^is_{0|j}\beta+208r^i_js_0\beta$$
$$+416s^i_{0|j}b^2\beta+896s^i_{0|j}\beta b^6+256s^i_{0|j}\beta b^8-832s^i_{j0}b^2\beta-208b^ir_{kj}s^k_0\beta-104s^ir_{j0}\beta+32\delta^i_js_0^2b^2$$
$$-432b^is_js_0b^2-576b^is_js_0b^4+64b^ir_{j0}r_0b-64b^ir_{j0}r_0b^2+256b^ir_{j0}r_0b^3-64b^ir_{j0}s_0b^4+256b^ir_{j0}s_0b^5$$
$$-64b^ir_{j0}r_0b^4+256b^ir_{j0}r_0b^5+64b^ir_jr_{00}b^2+528b^ib_js_ms_0^m\beta-64b^ir_jr_{00}b+48s^iy_js_0b^2+96s^iy_js_0b^4$$
$$+64s^iy_js_0b^6+16y^is_js_0b^4-32\delta^i_jr_0s_0b-64\delta^i_jr_0s_0b^2+64b^ir_{j0}s_0b-16b^ir_{j0}s_0b^2+256b^ir_{j0}s_0b^3$$
$$+128y^is_js_0b^5+32y^is_jr_0b^4-128y^is_jr_0b^5-128\delta^i_jr_0s_0b^5-64\delta^i_jr_0s_0b^4-256b^is_{0|j}\beta b^6+960b^is_{0|j}b^2\beta$$
$$+1344b^is_{0|j}\beta b^4+352b^is_js_0\beta-672b^is_{0|j}\beta b^4-512b^ib_js_0^2b^5+128b^ib_js_{0|0}b^6-16b^ib_jr_0s_0$$
$$-448b^ib_js_0^2b^4-128b^ib_jr_{0m}s_0^mb^6-512b^ib_js_0^2b-784b^ib_js_0^2b^2-1280b^ib_js_0^2b^3+96b^ib_jr_{0m}s_0^mb^2$$
$$+192b^ib_js_{0|0}b^2+288b^ib_js_{0|0}b^4-64b^iy_js_ms_0^mb^6-48b^iy_js_ms_0^mb^2-96b^iy_js_ms_0^mb^4-128\delta^i_jr_0s_0b^3$$

$$
\begin{aligned}
&+512r^i_js_0b^6\beta+320b^ir_js_0\beta+88b^is_jr_{00}b^2-192b^is_js_0b^6+64b^is_jr_{00}b^4+960r^i_js_0b^2\beta+1344r^i_js_0\beta b^4\\
&-160b^is_jr_0\beta-288y^is_ms^m_0b^2\beta-432y^is_ms^m_0\beta b^4-256b^ir_jr_{00}b^3+576\delta^i_js_ms^m_0b^2\beta+864\delta^i_js_ms^m_0b^4\beta\\
&-960b^ir_{kj}s^k_0b^2\beta+64b^ir_jr_{00}b^4-256b^ir_jr_{00}b^5+64y^ir_js_0b-64y^ir_js_0b^2+256y^ir_js_0b^3-64y^ir_js_0b^4\\
&+256y^ir_js_0b^5+192y^ib_js_ms^m_0b^4+48y^ib_js_ms^m_0b^2-64b^is_jr_{00}b+4\overline{R}^i_j-576s^i_ks^k_0b_jb^2\beta+1324s^i_0s_{0j}\\
&+432s^i_0b_js_0b^2+864s^i_0b_js_0b^4+576s^i_0b_js_0b^6-256r^i_0s_j\beta b^6-1152s^i_ks^k_0b_j\beta b^4-768s^i_ks^k_0b_j\beta b^6\\
&+192r^i_0b_js_0b^2+288r^i_0b_js_0b^4+128r^i_0b_js_0b^6-480r^i_0s_jb^2\beta-672r^i_0s_j\beta b^4+960b^ib_js_ms^m_0b^4\beta\\
&-512b^ib_jr_0s_0b^5+128b^ib_jr_0s_0b^4-512b^ib_jr_0s_0b+32b^ib_jr_0s_0b^2-640b^is_js_0b\beta-1792b^is_js_0b^3\beta\\
&-448b^is_jr_0b^2\beta+640b^is_jr_0b\beta+1792b^is_jr_0b^3\beta-1280b^ib_jr_0s_0b^3+1536b^ib_js_ms^m_0b^2\beta-96s^ib_js_0b^2\beta\\
&-384s^ib_js_0\beta b^4+896b^ir_js_0b^2\beta-1280b^ir_js_0b\beta-3584b^ir_js_0b^3\beta+688b^is_js_0b^2\beta+1024b^is_jr_0b^5\beta\\
&-1024b^is_js_0b^5\beta-256b^is_jr_0b^4\beta-2048b^ir_js_0b^5\beta+512b^ir_js_0\beta b^4+256b^is_js_0\beta b^4-104r^i_0s_j\beta\\
&-1008s^is_jb^2\beta^2-576s^is_j\beta^2b^4-96s^i_ks^k_0b_j\beta-1440s^i_ks^k_jb^2\beta^2-2016s^i_ks^k_j\beta^2b^4-768s^i_ks^k_j\beta^2b^6\\
&-96r^i_0r_{j0}b^4-48r^i_0r_{j0}b^2-64r^i_0r_{j0}b^6-256b^is_jr_{00}b^3-256b^is_jr_{00}b^5-192y^is_ms^m_0\beta b^6\\
&+384\delta^i_js_ms^m_0b^6\beta+576b^is_ms^m_0\beta^2b^4+192y^ib_js_ms^m_0b^6+512b^is_{0|j}\beta b^6+1008b^is_ms^m_0b^2\beta^2\\
&-256s^ir_{j0}\beta b^6-512b^ir_{kj}s^k_0\beta b^6-480s^ir_{j0}b^2\beta+480b^ir_{k0}s^k_jb^2\beta-144s^ib_jr_{00}b^4+40r^i_0b_js_0\\
&-128y^is_jr_0b^3-48s^ib_jr_{00}b^2-672s^ir_{j0}\beta b^4-128s^ib_jr_{00}b^6+32y^is_js_0b-8y^is_js_0b^2+128y^is_js_0b^3\\
&-32y^is_jr_0b+32y^is_jr_0b^2-480b^is_{0|j}b^2\beta+48s^ib_js_0\beta-1344b^ir_{kj}s^k_0\beta b^4+672b^ir_{k0}s^k_j\beta b^4+256b^ir_{k0}s^k_j\beta b^6
\end{aligned}
$$

$$
\begin{aligned}
t_{12} &:= -(4(2b^2+1))(-2s^i_ks^k_0b_j-22s^is_j\beta-14s^i_ks^k_j\beta-2r^i_0s_j-2b^is_{0|j}+4b^is_{0|j}+2b^ir_{k0}s^k_j+2\delta^i_js_ms^m_0\\
&+12s^i_{0|j}b^4+6s^i_{0|j}b^2+8s^i_{0|j}b^6-24s^i_{j0}b^4-y^is_ms^m_0-2s^ir_{j0}-4b^ir_{kj}s^k_0+4r^i_js_0-16s^i_{j0}b^6-12s^i_{j0}b^2\\
&+8b^ir_{k0}s^k_jb^4+8b^ir_{k0}s^k_jb^2-16b^ir_{kj}s^k_0b^4-16b^ir_{kj}s^k_0b^2-8s^ir_{j0}b^4-8s^ir_{j0}b^2-8b^is_{0|j}b^2+22b^is_ms^m_0\beta\\
&+10b^is_js_0-8b^is_{0|j}b^4+2s^ib_js_0+16r^i_js_0b^2+16r^i_js_0b^4+8b^ir_js_0+8\delta^i_js_ms^m_0b^2+8\delta^i_js_ms^m_0b^4\\
&+16b^is_{0|j}b^4-4b^is_jr_0-4y^is_ms^m_0b^4-4y^is_ms^m_0b^2+16b^ib_js_ms^m_0+16b^is_{0|j}b^2-32b^ir_js_0b\\
&-32b^is_js_0b^3+40b^ib_js_ms^m_0b^2+16b^ib_js_ms^m_0b^4+8b^is_js_0b^2+16b^is_jr_0b-8b^is_jr_0b^2+32b^is_jr_0b^3\\
&-16b^ir_js_0b^2+52b^is_ms^m_0b^2\beta+16b^is_ms^m_0\beta b^4-16s^ib_js_0b^4-64b^ir_js_0b^3-2s^i_{j0}+s^i_{0|j}\\
&-4s^ib_js_0b^2-8r^i_0s_jb^4-52s^is_jb^2\beta-16s^is_j\beta b^4-60s^i_ks^k_jb^2\beta-72s^i_ks^k_j\beta b^4-16b^is_js_0b\\
&-16s^i_ks^k_j\beta b^6-8r^i_0s_jb^2-24s^i_ks^k_0b_jb^4-12s^i_ks^k_0b_jb^2-16s^i_ks^k_0b_jb^6)\\
t_{13} &:= 4(2b^2+1)^3(-2s^i_ks^k_jb^2-s^i_ks^k_j-2s^is_j+2b^is_ms^m_j).
\end{aligned}
$$

7. Appendix 2: Coefficients in (4)

$$
\begin{aligned}
d_0 &:= -288r^2_{00}(8n-11)\beta^7,\\
d_1 &:= 48\beta^6(-54r_{00|0}\beta+80r^2_{00}nb^2-163r^2_{00}-104r^2_{00}b^2+124r^2_{00}n+36r_{00|0}n\beta),\\
d_2 &:= -24\beta^5(108\overline{\mathrm{Ric}}\beta^2+384r_{00}s_0b\beta+96r_{00}s_0n\beta+198r_{00|0}n\beta-192r_{00}s_0nb\beta-192r_{00}r_0nb\beta\\
&-276r_{00|0}\beta-120r_{00}s_0\beta+384r_{00}r_0b\beta-96r_{00}r_0n\beta-192r_{00|0}\beta b^2+144r_{00}r_0\beta+144r_{00|0}n\beta b^2\\
&+64r^2_{00}nb^4-64r^2_{00}b^4-512r^2_{00}b^2+392r^2_{00}nb^2-360r^2_{00}+273r^2_{00}n)\\
d_3 &:= 12\beta^4(784r_{00}r_0\beta+462r_{00|0}n\beta-224r_{00|0}b^4\beta-112r_{00}s_0\beta-800r_{00|0}\beta b^2+288r^2_{00}nb^4\\
&+808r^2_{00}nb^2+288r_{0m}s^m_0n\beta^2+144s_{0|0}n\beta^2+144r_{00}r^m_m\beta^2+144r_{00|m}b^m\beta^2-144r_{0m|0}b^m\beta^2\\
&+336r_{00}s_0n\beta+1632r_{00}s_0b\beta-512r_{00}s_0\beta b^2+768r_{00}s_0\beta b^3-464r_{00}r_0n\beta+1632r_{00}r_0b\beta\\
&-512r_{00}s_0nb^3\beta+384r_{00}s_0nb^2\beta-928r_{00}r_0nb\beta-512r_{00}r_0nb^3\beta-256r_{00}r_0nb^2\beta+320r_{00}r_0\beta b^2\\
&+696r_{00|0}n\beta b^2+192r_{00|0}n\beta b^4-468r^2_{00}-256r^2_{00}b^4-1184r^2_{00}b^2+335r^2_{00}n-596r_{00|0}\beta+768r_{00}r_0\beta b^3\\
&-144r_{0m}r^m_0\beta^2-288r_{0m}s^m_0\beta^2-360s_{0|0}\beta^2+612\overline{\mathrm{Ric}}\beta^2+576\overline{\mathrm{Ric}}\beta^2b^2-928r_{00}s_0nb\beta)
\end{aligned}
$$

$$
\begin{aligned}
d_4 := &-2\beta^3(5360r_{00}r_0\beta + 1778r_{00|0}n\beta - 2112r_{00|0}b^4\beta - 256r_{00|0}b^6\beta + 2144r_{00}s_0\beta - 3936r_{00|0}\beta b^2 \\
&+6912s_0^2b\beta^2 + 576rr_{00}\beta^2 + 2304r_0^2b\beta^2 - 288r_0s_0\beta^2 + 1584r_{00}^2nb^4 + 2712r_{00}^2nb^2 \\
&-1728r_{0m}r_0^mb^2\beta^2 + 3888r_{0m}s_0^mn\beta^2 - 2880r_{0m}s_0^m\beta^2b^2 + 1944s_{0|0}n\beta^2 - 4032s_{0|0}\beta^2b^2 \\
&+2160r_{00}r_m^m\beta^2 + 2160r_{00|m}b^m\beta^2 - 2160r_{0m|0}b^m\beta^2 + 1384r_{00}s_0n\beta - 2304s_0^2nb\beta^2 \\
&+8416r_{00}s_0b\beta - 4288r_{00}s_0\beta b^2 + 1024r_{00}s_0\beta b^5 + 6400r_{00}s_0\beta b^3 - 2768r_{00}r_0n\beta \\
&+8416r_{00}r_0b\beta + 1024r_{00}s_0nb^4\beta - 5536r_{00}s_0nb\beta - 6400r_{00}s_0nb^3\beta - 1024r_{00}s_0nb^5\beta \\
&+4288r_{00}s_0nb^2\beta - 512r_{00}r_0nb^4\beta - 5536r_{00}r_0nb\beta - 6400r_{00}r_0nb^3\beta - 1024r_{00}r_0nb^5\beta \\
&-3200r_{00}r_0nb^2\beta - 2304r_0s_0nb\beta^2 + 4352r_{00}r_0\beta b^2 + 512r_{00}r_0\beta b^4 + 1024r_{00}r_0\beta b^5 \\
&+6400r_{00}r_0\beta b^3 + 4152r_{00|0}n\beta b^2 + 2400r_{00|0}n\beta b^4 + 256r_{00|0}n\beta b^6 - 1024r_{00}s_0b^4\beta \\
&-2304rr_{00}b\beta^2 - 1152r_0s_0n\beta^2 + 8064r_0s_0b\beta^2 + 3456r_{0m}s_0^mn\beta^2b^2 - 1149r_{00}^2 \\
&-1440r_{00}^2b^4 - 4944r_{00}^2b^2 + 753r_{00}^2n - 2120r_{00|0}\beta - 144s_0^2\beta^2 - 576r_0^2\beta^2 - 2160r_{0m}r_0^m\beta^2 \\
&-3168r_{0m}s_0^m\beta^2 - 4824s_{0|0}\beta^2 - 1296s_{0|m}^m\beta^3 + 4428\overline{\mathrm{Ric}}\beta^2 + 3456\overline{\mathrm{Ric}}\beta^2b^4 \\
&+8640\overline{\mathrm{Ric}}\beta^2b^2 + 1728s_{0|0}n\beta^2b^2 + 1728r_{00}r_m^mb^2\beta^2 + 1728r_{00|m}b^mb^2\beta^2 - 1728r_{0m|0}b^mb^2\beta^2)
\end{aligned}
$$

$$
\begin{aligned}
d_5 := &-\beta^2(-6544r_{00}r_0\beta - 1354r_{00|0}n\beta + 2112r_{00|0}b^4\beta + 512r_{00|0}b^6\beta - 5488r_{00}s_0\beta + 3168r_{00|0}\beta b^2 \\
&+1632s_0^2n\beta^2 + 1920s_0^2\beta^2b^2 - 15360s_0^2b^3\beta^2 - 21504s_0^2b\beta^2 - 2496rr_{00}\beta^2 + 2304r_{0m|0}b^mb^4\beta^2 \\
&+1536r_0^2b^2\beta^2 - 9984r_0^2b\beta^2 - 6144r_0^2b^3\beta^2 - 2400r_0s_0\beta^2 - 1488r_{00}^2nb^4 - 1752r_{00}^2nb^2 \\
&+7488r_{0m}r_0^mb^2\beta^2 + 2304r_{0m}r_0^mb^4\beta^2 - 7200r_{0m}s_0^mn\beta^2 + 7104r_{0m}s_0^m\beta^2b^2 \\
&+3072r_{0m}s_0^m\beta^2b^4 - 3600s_{0|0}n\beta^2 + 14784s_{0|0}\beta^2b^2 + 4992s_{0|0}\beta^2b^4 - 1728s_ms_0^mn\beta^3 \\
&-4464r_{00}r_m^m\beta^2 - 4464r_{00|m}b^m\beta^2 + 4464r_{0m|0}b^m\beta^2 - 648s_ms_0^m\beta^2 - 1728s_0r_m^m\beta^3 \\
&-1728s_{0|m}b^m\beta^3 + 864s_{m|0}b^m\beta^3 + 6912s_{0|m}^m\beta^3b^2 - 992r_{00}s_0n\beta - 7520r_{00}s_0b\beta \\
&+5312r_{00}s_0\beta b^2 - 512r_{00}s_0\beta b^5 - 4352r_{00}s_0\beta b^3 + 2896r_{00}r_0n\beta - 7520r_{00}r_0b\beta - 3584r_{00}s_0nb^4\beta \\
&+5792r_{00}s_0nb\beta + 10496r_{00}s_0nb^3\beta + 3584r_{00}s_0nb^5\beta - 6656r_{00}s_0nb^2\beta + 1792r_{00}r_0nb^4\beta \\
&+5792r_{00}r_0nb\beta + 10496r_{00}r_0nb^3\beta + 3584r_{00}r_0nb^5\beta + 5248r_{00}r_0nb^2\beta + 8832r_0s_0nb\beta^2 \\
&+6144r_0s_0nb^3\beta^2 + 3072r_0s_0n\beta^2b^2 - 7936r_{00}r_0\beta b^2 - 1792r_{00}r_0\beta b^4 - 512r_{00}r_0\beta b^5 \\
&-4352r_{00}r_0\beta b^3 - 4344r_{00|0}n\beta b^2 - 3936r_{00|0}n\beta b^4 - 896r_{00|0}n\beta b^6 + 2048r_{00}s_0b^4\beta + 8832s_0^2nb\beta^2 \\
&+6144s_0^2nb^3\beta^2 - 768s_0^2n\beta^2b^2 - 1536rr_{00}b^2\beta^2 + 9984rr_{00}b\beta^2 + 6144rr_{00}b^3\beta^2 \\
&+4416r_0s_0n\beta^2 + 1536r_0s_0\beta^2b^2 - 18432r_0s_0b^3\beta^2 - 28800r_0s_0b\beta^2 - 13248r_{0m}s_0^mn\beta^2b^2 \\
&-4608r_{0m}s_0^mn\beta^2b^4 + 567r_{00}^2 + 1632r_{00}^2b^4 + 4200r_{00}^2b^2 - 351r_{00}^2n + 1498r_{00|0}\beta - 5520s_0^2\beta^2 \\
&+2496r_0^2\beta^2 + 4464r_{0m}r_0^m\beta^2 + 4512r_{0m}s_0^m\beta^2 + 8952s_{0|0}\beta^2 + 3456s_ms_0^m\beta^3 \\
&-2592s_mr_0^m\beta^3 + 1728r_ms_0^m\beta^3 + 6048s_{0|m}^m\beta^3 - 5892\overline{\mathrm{Ric}}\beta^2 - 14976\overline{\mathrm{Ric}}\beta^2b^4 \\
&-17856\overline{\mathrm{Ric}}\beta^2b^2 - 3072\overline{\mathrm{Ric}}\beta^2b^6 - 6624s_{0|0}n\beta^2b^2 - 2304s_{0|0}n\beta^2b^4 + 7488r_{0m|0}b^mb^2\beta^2 \\
&-7488r_{00}r_m^mb^2\beta^2 - 2304r_{00}r_m^mb^4\beta^2 - 7488r_{00|m}b^mb^2\beta^2 - 2304r_{00|m}b^mb^4\beta^2)
\end{aligned}
$$

$$
\begin{aligned}
d_6 := &\,2\beta(-1128r_{00}r_0\beta - 153r_{00|0}n\beta + 96r_{00|0}b^4\beta - 1386r_{00}s_0\beta + 312r_{00|0}\beta b^2 + 1148s_0^2n\beta^2 \\
&-2976s_0^2\beta^2b^2 + 384s_0^2\beta^2b^4 - 2048s_0^2b^5\beta^2 - 6272s_0^2b^3\beta^2 - 6368s_0^2b\beta^2 - 1072rr_{00}\beta^2 \\
&+1408r_0^2b^2\beta^2 + 256r_0^2b^4\beta^2 - 4288r_0^2b\beta^2 - 5632r_0^2b^3\beta^2 - 1024r_0^2b^5\beta^2 - 2208r_0s_0\beta^2 \\
&-180r_{00}^2nb^4 - 156r_{00}^2nb^2 + 3216r_{0m}r_0^mb^2\beta^2 + 2112r_{0m}r_0^mb^4\beta^2 + 256r_{0m}r_0^mb^6\beta^2 - 1728s_0r_m^m\beta^3b^2 \\
&-1756r_{0m}s_0^mn\beta^2 + 1008r_{0m}s_0^m\beta^2b^2 + 768r_{0m}s_0^m\beta^2b^4 + 256r_{0m}s_0^mb^6\beta^2 - 878s_{0|0}n\beta^2 \\
&+5328s_{0|0}\beta^2b^2 + 3552s_{0|0}\beta^2b^4 + 512s_{0|0}b^6\beta^2 - 576rs_0\beta^3 - 1512s_ms_0^mn\beta^3 + 3168s_ms_0^m\beta^3b^2 \\
&+2592s_mr_0^m\beta^3b^2 + 1728r_ms_0^m\beta^3b^2 - 1220r_{00}r_m^m\beta^2 - 1220r_{00|m}b^m\beta^2 + 1220r_{0m|0}b^m\beta^2 \\
&-432s_ms_0^m\beta^2 - 1728s_0r_m^m\beta^3 - 1728s_{0|m}b^m\beta^3 + 864s_{m|0}b^m\beta^3 + 6912s_{0|m}^m\beta^3b^2 + 864s_{m|0}b^m\beta^3b^2 \\
&+3456s_{0|m}^m\beta^3b^4 - 114r_{00}s_0n\beta - 936r_{00}s_0b\beta + 1200r_{00}s_0\beta b^2 + 1152r_{00}s_0\beta b^5 - 1728s_{0|m}b^m\beta^3b^2
\end{aligned}
$$

$+576r_{00}s_0\beta b^3+420r_{00}r_0n\beta-936r_{00}r_0b\beta-1248r_{00}s_0nb^4\beta+840r_{00}s_0nb\beta+2112r_{00}s_0nb^3\beta$
$+1152r_{00}s_0nb^5\beta-1392r_{00}s_0nb^2\beta+576r_{00}r_0nb^4\beta+840r_{00}r_0nb\beta+2112r_{00}r_0nb^3\beta$
$+1152r_{00}r_0nb^5\beta+1056r_{00}r_0nb^2\beta+3328r_0s_0nb\beta^2+4864r_0s_0nb^3\beta^2+1024r_0s_0nb^5\beta^2$
$+2432r_0s_0n\beta^2b^2+512r_0s_0n\beta^2b^4-1824r_{00}r_0\beta b^2-576r_{00}r_0\beta b^4+1152r_{00}r_0\beta b^5-864s_ms_0^mb^2\beta^2$
$+576r_{00}r_0\beta b^3-630r_{00|0}n\beta b^2-792r_{00|0}n\beta b^4-288r_{00|0}n\beta b^6+384r_{00}s_0b^4\beta+3328s_0^2nb\beta^2$
$+4864s_0^2nb^3\beta^2+1024s_0^2nb^5\beta^2+1376s_0^2n\beta^2b^2-256s_0^2n\beta^2b^4-1408rr_{00}b^2\beta^2+256r_{0m|0}b^mb^6\beta^2$
$-256rr_{00}b^4\beta^2+4288rr_{00}b\beta^2+5632rr_{00}b^3\beta^2+1024rr_{00}b^5\beta^2+1664r_0s_0n\beta^2+2112r_{0m|0}b^mb^4\beta^2$
$-2208r_0s_0\beta^2b^2+384r_0s_0\beta^2b^4-2560r_0s_0b^5\beta^2-11776r_0s_0b^3\beta^2-10144r_0s_0b\beta^2$
$-4992r_{0m}s_0^mn\beta^2b^2-3648r_{0m}s_0^mn\beta^2b^4+36r_{00}^2+264r_{00}^2b^4+492r_{00}^2b^2+3216r_{0m|0}b^mb^2\beta^2$
$-24r_{00}^2n+159r_{00|0}\beta-4932s_0^2\beta^2+1072r_0^2\beta^2+1220r_{0m}r_0^m\beta^2+776r_{0m}s_0^m\beta^2-256r_{00|m}b^mb^6\beta^2$
$+2218s_{0|0}\beta^2+2880s_ms_0^m\beta^3+2592s_mr_0^m\beta^3+1728r_ms_0^m\beta^3+2916s_{0|m}^m\beta^3-2112r_{00}r_m^mb^4\beta^2$
$-1168\overline{\mathrm{Ric}}\beta^2+324s_m^is_i^m\beta^4-6432\overline{\mathrm{Ric}}\beta^2b^4-256\overline{\mathrm{Ric}}\beta^2b^8-4880\overline{\mathrm{Ric}}\beta^2b^2-256r_{00}r_m^mb^6\beta^2$
$-2816\overline{\mathrm{Ric}}\beta^2b^6-512r_{0m}s_0^mn\beta^2b^6-2496s_{0|0}n\beta^2b^2-1824s_{0|0}n\beta^2b^4-3216r_{00|m}b^mb^2\beta^2$
$-256s_{0|0}n\beta^2b^6+2304rs_0b\beta^3-1728s_ms_0^mn\beta^3b^2-3216r_{00}r_m^mb^2\beta^2-2112r_{00|m}b^mb^4\beta^2)$

$d_7=(416r_{00}r_0\beta+38r_{00|0}n\beta+120r_{00|0}b^4\beta+128r_{00|0}b^6\beta+680r_{00}s_0\beta-48r_{00|0}\beta b^2-1172s_0^2n\beta^2$
$+9280s_0^2\beta^2b^2+6016s_0^2\beta^2b^4-2048s_0^2b^5\beta^2-128s_0^2b^3\beta^2+3616s_0^2b\beta^2+912rr_{00}\beta^2+24r_{00}^2nb^2$
$-1920r_0^2b^2\beta^2-768r_0^2b^4\beta^2+3648r_0^2b\beta^2+7680r_0^2b^3\beta^2+3072r_0^2b^5\beta^2-2736r_{0m}r_0^mb^2\beta^2$
$+2624r_0s_0\beta^2 36r_{00}^2nb^4-2880r_{0m}r_0^mb^4\beta^2-768r_{0m}r_0^mb^6\beta^2+952r_{0m}s_0^mn\beta^2-3840s_ms_0^m\beta^3b^4$
$+624r_{0m}s_0^m\beta^2b^2+1536r_{0m}s_0^m\beta^2b^4+256r_{0m}s_0^mb^6\beta^2+476s_{0|0}n\beta^2-3792s_{0|0}\beta^2b^2$
$+-3552s_{0|0}\beta^2b^4-1024s_{0|0}b^6\beta^2+1920rs_0\beta^3+2088s_ms_0^mn\beta^3-7872s_ms_0^m\beta^3b^2$
$-8640s_mr_0^m\beta^3b^2-3456s_mr_0^m\beta^3b^4-5760r_ms_0^m\beta^3b^2-2304r_ms_0^m\beta^3b^4+744r_{00}r_m^m\beta^2$
$+744r_{00|m}b^m\beta^2-744r_{0m|0}b^m\beta^2+432s_ms_0^m\beta^2+2736s_0r_m^m\beta^3+2736s_{0|m}b^m\beta^3-1664r_{00}r_0\beta b^5$
$-1368s_{m|0}b^m\beta^3-10944s_{0|m}^m\beta^3b^2-11520s_{0|m}^m\beta^3b^4-3072s_{0|m}^m\beta^3b^6-5632r_0s_0nb^3\beta^2$
$+40r_{00}s_0n\beta+256r_{00}s_0b\beta-784r_{00}s_0\beta b^2-1664r_{00}s_0\beta b^5-896r_{00}s_0\beta b^3-128r_{00}r_0n\beta+256r_{00}r_0b\beta$
$+832r_{00}s_0nb^4\beta-256r_{00}s_0nb\beta-832r_{00}s_0nb^3\beta-640r_{00}s_0nb^5\beta+640r_{00}s_0nb^2\beta-320r_{00}r_0nb^4\beta$
$-256r_{00}r_0nb\beta-832r_{00}r_0nb^3\beta-640r_{00}r_0nb^5\beta-416r_{00}r_0nb^2\beta-2464r_0s_0nb\beta^2-896r_{00}r_0\beta b^3$
$-2560r_0s_0nb^5\beta^2-2816r_0s_0n\beta^2b^2-1280r_0s_0n\beta^2b^4+848r_{00}r_0\beta b^2+320r_{00}r_0\beta b^4-1728s_m^is_i^m\beta^4b^2$
$+192r_{00|0}n\beta b^2+312r_{00|0}n\beta b^4+160r_{00|0}n\beta b^6-256r_{00}s_0b^4\beta-2464s_0^2nb\beta^2-5632s_0^2nb^3\beta^2$
$-2560s_0^2nb^5\beta^2-3392s_0^2n\beta^2b^2-3968s_0^2n\beta^2b^4+1920rr_{00}b^2\beta^2+768rr_{00}b^4\beta^2-3648rr_{00}b\beta^2$
$-7680rr_{00}b^3\beta^2-3072rr_{00}b^5\beta^2-1232r_0s_0n\beta^2+6368r_0s_0\beta^2b^2+3968r_0s_0\beta^2b^4+3584r_0s_0b^5\beta^2$
$+9728r_0s_0b^3\beta^2+7136r_0s_0b\beta^2+3696r_{0m}s_0^mn\beta^2b^2+4224r_{0m}s_0^mn\beta^2b^4-3r_{00}^2-72r_{00}^2b^4$
$-96r_{00}^2b^2+3r_{00}^2n-38r_{00|0}\beta+6340s_0^2\beta^2-912r_0^2\beta^2-744r_{0m}r_0^m\beta^2-256r_{0m}s_0^m\beta^2-1244s_{0|0}\beta^2$
$-3840s_ms_0^m\beta^3-4104s_mr_0^m\beta^3-2736r_ms_0^m\beta^3-2976s_{0|m}^m\beta^3+552\overline{\mathrm{Ric}}\beta^2-864s_ms^m\beta^4$
$-1188s_m^is_i^m\beta^4+5472\overline{\mathrm{Ric}}\beta^2b^4+768\overline{\mathrm{Ric}}\beta^2b^8+2976\overline{\mathrm{Ric}}\beta^2b^2+3840\overline{\mathrm{Ric}}\beta^2b^6-6144rs_0\beta^3b^3$
$+1280r_{0m}s_0^mn\beta^2b^6+1848s_{0|0}n\beta^2b^2+2112s_{0|0}n\beta^2b^4+640s_{0|0}n\beta^2b^6+1536rs_0\beta^3b^2$
$-7680rs_0b\beta^3+4896s_ms_0^mn\beta^3b^2+2304s_ms_0^mn\beta^3b^4+2736r_{00}r_m^mb^2\beta^2+2880r_{00}r_m^mb^4\beta^2$
$+768r_{00}r_m^mb^6\beta^2+2736r_{00|m}b^mb^2\beta^2+2880r_{00|m}b^mb^4\beta^2+768r_{00|m}b^mb^6\beta^2-2736r_{0m|0}b^mb^2\beta^2$
$-2880r_{0m|0}b^mb^4\beta^2-768r_{0m|0}b^mb^6\beta^2+1728s_ms_0^mb^4\beta^2+1728s_ms_0^mb^2\beta^2+5760s_0r_m^m\beta^3b^2$
$+2304s_0r_m^m\beta^3b^4+5760s_{0|m}b^m\beta^3b^2+2304s_{0|m}b^m\beta^3b^4-2880s_{m|0}b^m\beta^3b^2-1152s_{m|0}b^m\beta^3b^4$

$d_8=64r_{00}s_0b^4+112r_{00}s_0b^2-4r_{00}s_0n+320r_{00}s_0b^5+128r_{00}s_0b^3-16r_{00}s_0b-32r_{00}r_0b^4$
$-80r_{00}r_0b^2+8r_{00}r_0n+320r_{00}r_0b^5+128r_{00}r_0b^3-16r_{00}r_0b-12r_{00|0}nb^2+4352s_0^2\beta b^5$
$-24r_{00|0}nb^4-16r_{00|0}nb^6+256s_0^2n\beta-3904s_0^2\beta b^2-5440s_0^2\beta b^4-512s_0^2b\beta+2048s_0^2\beta b^3$

$$
\begin{aligned}
&-2816s_0^2\beta b^6+1024s_0^2\beta b^7-192rr_{00}\beta+576r_0^2b^2\beta+384r_0^2b^4\beta-768r_0^2b\beta-2304r_0^2b^3\beta\\
&-1536r_0^2b^5\beta-672r_0s_0\beta+576r_{0m}r_0^mb^2\beta+864r_{0m}r_0^mb^4\beta+384r_{0m}r_0^mb^6\beta-384r_{0m}s_0^m\beta b^2\\
&-1152r_{0m}s_0^m\beta b^4-136r_{0m}s_0^mn\beta-640r_{0m}s_0^m\beta b^6+672s_{0|0}\beta b^2+720s_{0|0}\beta b^4-68s_{0|0}n\beta\\
&+256s_{0|0}\beta b^6-1184rs_0\beta^2-712s_ms_0^mn\beta^2+3504s_ms_0^m\beta^2b^2+3072s_ms_0^m\beta^2b^4+768s_ms_0^mb^6\beta^2\\
&+5328s_mr_0^mb^2\beta^2+4608s_mr_0^m\beta^2b^4+768s_mr_0^m\beta^2b^6+3552r_ms_0^mb^2\beta^2+3072r_ms_0^m\beta^2b^4\\
&+512r_ms_0^m\beta^2b^6-120r_{00}r_m^m\beta-120r_{00|m}b^m\beta+120r_{0m|0}b^m\beta-96s_ms_0^m\beta-1072s_0r_m^m\beta^2\\
&-1072s_{0|m}b^m\beta^2+536s_{m|0}b^m\beta^2+4288s_{0|m}^m\beta^2b^2+7104s_{0|m}^m\beta^2b^4+4096s_{0|m}^mb^6\beta^2+448r_0s_0nb\beta\\
&+512s_{0|m}^m\beta^2b^8+1296s_ms^m\beta^3+864s_m^is_i^m\beta^3-112r_{00}s_0nb^4+16r_{00}s_0nb+64r_{00}s_0nb^3\\
&+64r_{00}s_0nb^5-64r_{00}s_0nb^2+32r_{00}r_0nb^4+16r_{00}r_0nb+64r_{00}r_0nb^3+64r_{00}r_0nb^5+448s_0^2nb\beta\\
&+1408r_0s_0nb^3\beta+1024r_0s_0nb^5\beta+704r_0s_0n\beta b^2+512r_0s_0n\beta b^4+32r_{00}r_0nb^2+1408s_0^2nb^3\beta\\
&+1024s_0^2nb^5\beta+1184s_0^2n\beta b^2+2912s_0^2n\beta b^4+2560s_0^2n\beta b^6-576rr_{00}b^2\beta-384rr_{00}b^4\beta\\
&+768rr_{00}b\beta+2304rr_{00}b^3\beta+1536rr_{00}b^5\beta+224r_0s_0n\beta-2528r_0s_0\beta b^2-3584r_0s_0\beta b^4\\
&-1280r_0s_0b\beta-1280r_0s_0\beta b^3+256r_0s_0\beta b^5-1280r_0s_0\beta b^6-672r_{0m}s_0^mn\beta b^2-68r_{00}s_0\\
&-1056r_{0m}s_0^mn\beta b^4-512r_{0m}s_0^mnb^6\beta+2r_{00|0}-32r_{00}r_0-2r_{00|0}n-24r_{00|0}b^4-32r_{00|0}b^6\\
&-1808s_0^2\beta+192r_0^2\beta+120r_{0m}r_0^m\beta+16r_{0m}s_0^m\beta+188s_{0|0}\beta+1296s_ms_0^m\beta^2+2592s_m^is_i^m\beta^3b^2\\
&+1608s_mr_0^m\beta^2+1072r_ms_0^m\beta^2+848s_{0|m}^m\beta^2-72\overline{\mathrm{Ric}}\beta-1152\overline{\mathrm{Ric}}\beta b^4-384\overline{\mathrm{Ric}}\beta b^8\\
&-480\overline{\mathrm{Ric}}\beta b^2-1152\overline{\mathrm{Ric}}\beta b^6-336s_{0|0}n\beta b^2-528s_{0|0}n\beta b^4-256s_{0|0}nb^6\beta+2048rs_0b^5\beta^2\\
&-2048rs_0b^2\beta^2+4736rs_0b\beta^2+8192rs_0b^3\beta^2-2544s_ms_0^mn\beta^2b^2-2496s_ms_0^mn\beta^2b^4\\
&-512s_ms_0^mnb^6\beta^2-512rs_0b^4\beta^2-576r_{00}r_m^mb^2\beta-864r_{00}r_m^mb^4\beta-384r_{00}r_m^mb^6\beta\\
&-576r_{00|m}b^mb^2\beta-864r_{00|m}b^mb^4\beta-384r_{00|m}b^mb^6\beta+576r_{0m|0}b^mb^2\beta+864r_{0m|0}b^mb^4\beta\\
&+384r_{0m|0}b^mb^6\beta+1728s_m^is_i^m\beta^3b^4-576s_ms_0^m\beta b^2-1152s_ms_0^m\beta b^4-768s_ms_0^m\beta b^6\\
&-3552s_0r_m^mb^2\beta^2-3072s_0r_m^m\beta^2b^4-512s_0r_m^m\beta^2b^6-3552s_{0|m}b^mb^2\beta^2-3072s_{0|m}b^m\beta^2b^4\\
&-512s_{0|m}b^m\beta^2b^6+1776s_{m|0}b^mb^2\beta^2+1536s_{m|0}b^m\beta^2b^4+256s_{m|0}b^m\beta^2b^6+1728s_ms^m\beta^3b^2
\end{aligned}
$$

$$
\begin{aligned}
d_9:=\;&4\overline{\mathrm{Ric}}-128s_0^2nb^2-496s_0^2nb^4-896s_0^2nb^6-32s_0^2nb-128s_0^2nb^3-128s_0^2nb^5-512s_0^2nb^8\\
&+64rr_{00}b^2+64rr_{00}b^4-64rr_{00}b-256rr_{00}b^3-256rr_{00}b^5-16r_0s_0n+320r_0s_0b^2+704r_0s_0b^4\\
&+640r_0s_0b^6-384r_0s_0b^5+96r_0s_0b+48r_{0m}s_0^mnb^2+96r_{0m}s_0^mnb^4+64r_{0m}s_0^mnb^6\\
&+24s_{0|0}nb^2+48s_{0|0}nb^4+32s_{0|0}nb^6+320rs_0\beta+120s_ms_0^mn\beta-672s_ms_0^m\beta b^2-576s_ms_0^m\beta b^4\\
&-256s_ms_0^m\beta b^6-1440s_mr_0^m\beta b^2-2016s_mr_0^m\beta b^4-768s_mr_0^m\beta b^6-960r_ms_0^m\beta b^2+64s_ms_0^mb^2\\
&-1344r_ms_0^m\beta b^4-512r_ms_0^m\beta b^6+48r_{00}r_m^mb^2+96r_{00}r_m^mb^4+64r_{00}r_m^mb^6+48r_{00|m}b^mb^2\\
&+96r_{00|m}b^mb^4+64r_{00|m}b^mb^6-48r_{0m|0}b^mb^2-96r_{0m|0}b^mb^4-64r_{0m|0}b^mb^6+192s_ms_0^mb^4\\
&+256s_ms_0^mb^6+128s_ms_0^mb^8+208s_0r_m^m\beta+208s_{0|m}b^m\beta-104s_{m|0}b^m\beta-832s_{0|m}^m\beta b^2\\
&-1920s_{0|m}^m\beta b^4-1792s_{0|m}^m\beta b^6-512s_{0|m}^m\beta b^8-720s_ms^m\beta^2-312s_m^is_i^m\beta^2-64r_0s_0nb^2\\
&-64r_0s_0nb^4-32r_0s_0nb-128r_0s_0nb^3-128r_0s_0nb^5-8r_{0m}r_0^m+16rr_{00}+8r_{00}r_m^m+8r_{00|m}b^m\\
&-8r_{0m|0}b^m+196s_0^2-16r_0^2-12s_{0|0}-20s_0^2n+512s_0^2b^2+1120s_0^2b^4+1152s_0^2b^6-384s_0^2b^3\\
&-512s_0^2b^7-1152s_0^2b^5+32s_0^2b+512s_0^2b^8-64r_0^2b^2-64r_0^2b^4+64r_0^2b+256r_0^2b^3+256r_0^2b^5\\
&+64r_0s_0-48r_{0m}r_0^mb^2-96r_{0m}r_0^mb^4-64r_{0m}r_0^mb^6+48r_{0m}s_0^mb^2+192r_{0m}s_0^mb^4+192r_{0m}s_0^mb^6\\
&+8r_{0m}s_0^mn-48s_{0|0}b^2-48s_{0|0}b^4+4s_{0|0}n-224s_ms_0^m\beta-312s_mr_0^m\beta-208r_ms_0^m\beta\\
&+8s_ms_0^m-128s_{0|m}^m\beta+96\overline{\mathrm{Ric}}b^4+64\overline{\mathrm{Ric}}b^8+32\overline{\mathrm{Ric}}b^2+128\overline{\mathrm{Ric}}b^6-1280rs_0b\beta+896rs_0\beta b^2\\
&+512rs_0\beta b^4-2048rs_0\beta b^5-3584rs_0\beta b^3+576s_ms_0^mn\beta b^2+864s_ms_0^mn\beta b^4+384s_ms_0^mn\beta b^6\\
&-768s_m^is_i^m\beta^2b^6+960s_0r_m^m\beta b^2+1344s_0r_m^m\beta b^4+512s_0r_m^m\beta b^6+960s_{0|m}b^m\beta b^2\\
&+1344s_{0|m}b^m\beta b^4+512s_{0|m}b^m\beta b^6-480s_{m|0}b^m\beta b^2-672s_{m|0}b^m\beta b^4-256s_{m|0}b^m\beta b^6
\end{aligned}
$$

$$-2016s_ms^mb^2\beta^2-1152s_ms^m\beta^2b^4-1440s^i_ms^m_ib^2\beta^2-2016s^i_ms^m_i\beta^2b^4$$

$$\begin{aligned}
d_{10} :=\ & 8(1+2b^2)^2(4s^i_ms^m_i\beta b^4+4s^m_{0|m}b^4-2s_ms^m_0nb^2+6s_mr^m_0b^2-4s_0r^m_mb^2+8s_ms^m\beta b^2\\
& -2s_ms^m_0b^2+16s^i_ms^m_i\beta b^2+4r_ms^m_0b^2+2s_{m|0}b^mb^2-4s_{0|m}b^mb^2+4s^m_{0|m}b^2+16rs_0b+7s^i_ms^m_i\beta\\
& +3s_mr^m_0+2r_ms^m_0+s_{m|0}b^m-4rs_0-2s_0r^m_m-2s_{0|m}b^m+22s_ms^m\beta+2s_ms^m_0+s^m_{0|m}-s_ms^m_0n)\\
d_{11} :=\ & -4(1+2b^2)^3(2s^i_ms^m_ib^2+s^i_ms^m_i+4s_ms^m)
\end{aligned}$$

8. Appendix 3: Coefficients in (5)

$$\begin{aligned}
d'_0 :=\ & 288(8n-11)\beta^7r^2_{00},\\
d'_2 :=\ & -24\beta^5(108\overline{\mathrm{Ric}}\beta^2-384r_{00}s_0b\beta-96r_{00}s_0n\beta-198r_{00|0}n\beta+192r_{00}s_0nb\beta+192r_{00}r_0nb\beta\\
& +276r_{00|0}\beta+120r_{00}s_0\beta-384r_{00}r_0b\beta+96r_{00}r_0n\beta+192r_{00|0}\beta b^2-144r_{00}r_0\beta-144r_{00|0}n\beta b^2\\
& -64r^2_{00}nb^4+64r^2_{00}b^4+512r^2_{00}b^2-392r^2_{00}nb^2+360r^2_{00}-273r^2_{00}n)\\
d'_4 :=\ & -2\beta^3(-5360r_{00}r_0\beta-1778r_{00|0}n\beta+2112r_{00|0}b^4\beta+256r_{00|0}b^6\beta-2144r_{00}s_0\beta+3936r_{00|0}\beta b^2\\
& -6912s^2_0b\beta^2-576rr_{00}\beta^2-2304r^2_0b\beta^2+288r_0s_0\beta^2-1584r^2_{00}nb^4-2712r^2_{00}nb^2\\
& +1728r_{0m}r^m_0b^2\beta^2-3888r_{0m}s^m_0n\beta^2+2880r_{0m}s^m_0\beta^2b^2-1944s_{0|0}n\beta^2+4032s_{0|0}\beta^2b^2\\
& -2160r_{00}r^m_m\beta^2-2160r_{00|m}b^m\beta^2+2160r_{0m|0}b^m\beta^2-1384r_{00}s_0n\beta+2304s^2_0nb\beta^2\\
& -8416r_{00}s_0b\beta+4288r_{00}s_0\beta b^2-1024r_{00}s_0\beta b^5-6400r_{00}s_0\beta b^3+2768r_{00}r_0n\beta\\
& -8416r_{00}r_0b\beta-1024r_{00}s_0nb^4\beta+5536r_{00}s_0nb\beta+6400r_{00}s_0nb^3\beta+1024r_{00}s_0nb^5\beta\\
& -4288r_{00}s_0nb^2\beta+512r_{00}r_0nb^4\beta+5536r_{00}r_0nb\beta+6400r_{00}r_0nb^3\beta+1024r_{00}r_0nb^5\beta\\
& +3200r_{00}r_0nb^2\beta+2304r_0s_0nb\beta^2-4352r_{00}r_0\beta b^2-512r_{00}r_0\beta b^4-1024r_{00}r_0\beta b^5\\
& -6400r_{00}r_0\beta b^3-4152r_{00|0}n\beta b^2-2400r_{00|0}n\beta b^4-256r_{00|0}n\beta b^6+1024r_{00}s_0b^4\beta\\
& +2304rr_{00}b\beta^2+1152r_0s_0n\beta^2-8064r_0s_0b\beta^2-3456r_{0m}s^m_0n\beta^2b^2+1149r^2_{00}\\
& +1440r^2_{00}b^4+4944r^2_{00}b^2-753r^2_{00}n+2120r_{00|0}\beta+144s^2_0\beta^2+576r^2_0\beta^2+2160r_{0m}r^m_0\beta^2\\
& +3168r_{0m}s^m_0\beta^2+4824s_{0|0}\beta^2+1296s^m_{0|m}\beta^3+4428(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2+3456(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^4\\
& +8640(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^2-1728s_{0|0}n\beta^2b^2-1728r_{00}r^m_mb^2\beta^2-1728r_{00|m}b^mb^2\beta^2-1728r_{0m|0}b^mb^2\beta^2)
\end{aligned}$$

$$\begin{aligned}
d'_6 :=\ & 2\beta(1128r_{00}r_0\beta+153r_{00|0}n\beta-96r_{00|0}b^4\beta+1386r_{00}s_0\beta-312r_{00|0}\beta b^2-1148s^2_0n\beta^2\\
& +2976s^2_0\beta^2b^2-384s^2_0\beta^2b^4+2048s^2_0b^5\beta^2+6272s^2_0b^3\beta^2+6368s^2_0b\beta^2+1072rr_{00}\beta^2\\
& -1408r^2_0b^2\beta^2-256r^2_0b^4\beta^2+4288r^2_0b\beta^2+5632r^2_0b^3\beta^2+1024r^2_0b^5\beta^2+2208r_0s_0\beta^2\\
& +180r^2_{00}nb^4+156r^2_{00}nb^2-3216r_{0m}r^m_0b^2\beta^2-2112r_{0m}r^m_0b^4\beta^2-256r_{0m}r^m_0b^6\beta^2+1728s_0r^m_m\beta^3b^2\\
& +1756r_{0m}s^m_0n\beta^2-1008r_{0m}s^m_0\beta^2b^2-768r_{0m}s^m_0\beta^2b^4-256r_{0m}s^m_0b^6\beta^2+878s_{0|0}n\beta^2\\
& -5328s_{0|0}\beta^2b^2-3552s_{0|0}\beta^2b^4-512s_{0|0}b^6\beta^2+576rs_0\beta^3+1512s_ms^m_0n\beta^3-3168s_ms^m_0\beta^3b^2\\
& -2592s_mr^m_0\beta^3b^2-1728r_ms^m_0\beta^3b^2+1220r_{00}r^m_m\beta^2+1220r_{00|m}b^m\beta^2-1220r_{0m|0}b^m\beta^2\\
& +432s_ms^m_0\beta^2+1728s_0r^m_m\beta^3+1728s_{0|m}b^m\beta^3-864s_{m|0}b^m\beta^3-6912s^m_{0|m}\beta^3b^2-864s_{m|0}b^m\beta^3b^2\\
& -3456s^m_{0|m}\beta^3b^4+114r_{00}s_0n\beta+936r_{00}s_0b\beta-1200r_{00}s_0\beta b^2-1152r_{00}s_0\beta b^5+1728s_{0|m}b^m\beta^3b^2\\
& -576r_{00}s_0\beta b^3-420r_{00}r_0n\beta+936r_{00}r_0b\beta+1248r_{00}s_0nb^4\beta-840r_{00}s_0nb\beta-2112r_{00}s_0nb^3\beta\\
& -1152r_{00}s_0nb^5\beta+1392r_{00}s_0nb^2\beta-576r_{00}r_0nb^4\beta-840r_{00}r_0nb\beta-2112r_{00}r_0nb^3\beta\\
& -1152r_{00}r_0nb^5\beta-1056r_{00}r_0nb^2\beta-3328r_0s_0nb\beta^2-4864r_0s_0nb^3\beta^2-1024r_0s_0nb^5\beta^2\\
& -2432r_0s_0n\beta^2b^2-+512r_0s_0n\beta^2b^4+1824r_{00}r_0\beta b^2+576r_{00}r_0\beta b^4-1152r_{00}r_0\beta b^5+864s_ms^m_0b^2\beta^2\\
& -576r_{00}r_0\beta b^3+630r_{00|0}n\beta b^2+792r_{00|0}n\beta b^4+288r_{00|0}n\beta b^6-384r_{00}s_0b^4\beta-3328s^2_0nb\beta^2\\
& -4864s^2_0nb^3\beta^2-1024s^2_0nb^5\beta^2-1376s^2_0n\beta^2b^2+256s^2_0n\beta^2b^4+1408rr_{00}b^2\beta^2-256r_{0m|0}b^mb^6\beta^2
\end{aligned}$$

$$+256rr_{00}b^4\beta^2-4288rr_{00}b\beta^2-5632rr_{00}b^3\beta^2-1024rr_{00}b^5\beta^2+1664r_0s_0n\beta^2-2112r_{0m|0}b^mb^4\beta^2$$
$$+2208r_0s_0\beta^2b^2-384r_0s_0\beta^2b^4+2560r_0s_0b^5\beta^2+11776r_0s_0b^3\beta^2+10144r_0s_0b\beta^2$$
$$+4992r_{0m}s_0^mn\beta^2b^2+3648r_{0m}s_0^mn\beta^2b^4-36r_{00}^2-264r_{00}^2b^4-492r_{00}^2b^2-3216r_{0m|0}b^mb^2\beta^2$$
$$+24r_{00}^2n-159r_{00|0}\beta+4932s_0^2\beta^2-1072r_0^2\beta^2-1220r_{0m}r_0^m\beta^2-776r_{0m}s_0^m\beta^2+256r_{00|m}b^mb^6\beta^2$$
$$-2218s_{0|0}\beta^2-2880s_ms_0^m\beta^3-2592s_mr_0^m\beta^3-1728r_ms_0^m\beta^3-2916s_{0|m}^m\beta^3+2112r_{00}r_m^mb^4\beta^2$$
$$-(\mathrm{Ric}-\overline{\mathrm{Ric}})\{1168\beta^2+6432\beta^2b^4+256\beta^2b^8+4880\beta^2b^2+2816\beta^2b^6\}+256r_{00}r_m^mb^6\beta^2$$
$$+512r_{0m}s_0^mn\beta^2b^6+2496s_{0|0}n\beta^2b^2+1824s_{0|0}n\beta^2b^4+3216r_{00|m}b^mb^2\beta^2-324s_m^is_i^m\beta^4$$
$$+256s_{0|0}n\beta^2b^6-2304rs_0b\beta^3+1728s_ms_0^mn\beta^3b^2+3216r_{00}r_m^mb^2\beta^2+2112r_{00|m}b^mb^4\beta^2)$$

$$\begin{aligned}
d_8' := {} & -64r_{00}s_0b^4-112r_{00}s_0b^2+4r_{00}s_0n-320r_{00}s_0b^5-128r_{00}s_0b^3+16r_{00}s_0b+32r_{00}r_0b^4\\
&+80r_{00}r_0b^2-8r_{00}r_0n-320r_{00}r_0b^5-128r_{00}r_0b^3+16r_{00}r_0b+12r_{00|0}nb^2-4352s_0^2\beta b^5\\
&+24r_{00|0}nb^4+16r_{00|0}nb^6-256s_0^2n\beta+3904s_0^2\beta b^2+5440s_0^2\beta b^4+512s_0^2b\beta-2048s_0^2\beta b^3\\
&+2816s_0^2\beta b^6-1024s_0^2\beta b^7+192rr_{00}\beta-576r_0^2b^2\beta-384r_0^2b^4\beta+768r_0^2b\beta+2304r_0^2b^3\beta\\
&+1536r_0^2b^5\beta+672r_0s_0\beta-576r_{0m}r_0^mb^2\beta-864r_{0m}r_0^mb^4\beta-384r_{0m}r_0^mb^6\beta+384r_{0m}s_0^m\beta b^2\\
&+1152r_{0m}s_0^m\beta b^4+136r_{0m}s_0^mn\beta+640r_{0m}s_0^m\beta b^6-672s_{0|0}\beta b^2-720s_{0|0}\beta b^4+68s_{0|0}n\beta\\
&-256s_{0|0}\beta b^6+1184rs_0\beta^2+712s_ms_0^mn\beta^2-3504s_ms_0^m\beta^2b^2-3072s_ms_0^m\beta^2b^4-768s_ms_0^mb^6\beta^2\\
&-5328s_mr_0^mb^2\beta^2-4608s_mr_0^m\beta^2b^4-768s_mr_0^m\beta^2b^6-3552r_ms_0^mb^2\beta^2-3072r_ms_0^m\beta^2b^4\\
&-512r_ms_0^m\beta^2b^6+120r_{00}r_m^m\beta+120r_{00|m}b^m\beta-120r_{0m|0}b^m\beta+96s_ms_0^m\beta+1072s_0r_m^m\beta^2\\
&+1072s_{0|m}b^m\beta^2-536s_{m|0}b^m\beta^2-4288s_{0|m}^m\beta^2b^2-7104s_{0|m}^m\beta^2b^4-4096s_{0|m}^mb^6\beta^2-448r_0s_0nb\beta\\
&-512s_{0|m}^m\beta^2b^8-1296s_ms^m\beta^3-864s_m^is_i^m\beta^3+112r_{00}s_0nb^4-16r_{00}s_0nb-64r_{00}s_0nb^3\\
&-64r_{00}s_0nb^5+64r_{00}s_0nb^2-32r_{00}r_0nb^4-16r_{00}r_0nb-64r_{00}r_0nb^3-64r_{00}r_0nb^5-448s_0^2nb\beta\\
&-1408r_0s_0nb^3\beta-1024r_0s_0nb^5\beta-704r_0s_0n\beta b^2-512r_0s_0n\beta b^4-32r_{00}r_0nb^2-1408s_0^2nb^3\beta\\
&-1024s_0^2nb^5\beta-1184s_0^2n\beta b^2-2912s_0^2n\beta b^4-2560s_0^2n\beta b^6+576rr_{00}b^2\beta+384rr_{00}b^4\beta\\
&-768rr_{00}b\beta-2304rr_{00}b^3\beta-1536rr_{00}b^5\beta-224r_0s_0n\beta+2528r_0s_0\beta b^2+3584r_0s_0\beta b^4\\
&+1280r_0s_0b\beta+1280r_0s_0\beta b^3-256r_0s_0\beta b^5+1280r_0s_0\beta b^6+672r_{0m}s_0^mn\beta b^2+68r_{00}s_0\\
&+1056r_{0m}s_0^mn\beta b^4+512r_{0m}s_0^mnb^6\beta-2r_{00|0}-32r_{00}r_0+2r_{00|0}n+24r_{00|0}b^4+32r_{00|0}b^6\\
&+1808s_0^2\beta-192r_0^2\beta-120r_{0m}r_0^m\beta-16r_{0m}s_0^m\beta-188s_{0|0}\beta-1296s_ms_0^m\beta^2-2592s_m^is_i^m\beta^3b^2\\
&-1608s_mr_0^m\beta^2-1072r_ms_0^m\beta^2-848s_{0|m}^m\beta^2-72(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta-1152(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^4\\
&-480(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^2-1152(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^6+336s_{0|0}n\beta b^2+528s_{0|0}n\beta b^4+256s_{0|0}nb^6\beta\\
&+2048rs_0b^2\beta^2-4736rs_0b\beta^2-8192rs_0b^3\beta^2+2544s_ms_0^mn\beta^2b^2+2496s_ms_0^mn\beta^2b^4-2048rs_0b^5\beta^2\\
&+512s_ms_0^mnb^6\beta^2+512rs_0b^4\beta^2+576r_{00}r_m^mb^2\beta+864r_{00}r_m^mb^4\beta+384r_{00}r_m^mb^6\beta-384(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^8\\
&+576r_{00|m}b^mb^2\beta+864r_{00|m}b^mb^4\beta+384r_{00|m}b^mb^6\beta-576r_{0m|0}b^mb^2\beta-864r_{0m|0}b^mb^4\beta\\
&-384r_{0m|0}b^mb^6\beta-1728s_m^is_i^m\beta^3b^4+576s_ms_0^m\beta b^2+1152s_ms_0^m\beta b^4+768s_ms_0^m\beta b^6\\
&+3552s_0r_m^mb^2\beta^2+3072s_0r_m^m\beta^2b^4+512s_0r_m^m\beta^2b^6+3552s_{0|m}b^mb^2\beta^2+3072s_{0|m}b^m\beta^2b^4\\
&+512s_{0|m}b^m\beta^2b^6-1776s_{m|0}b^mb^2\beta^2-1536s_{m|0}b^m\beta^2b^4-256s_{m|0}b^m\beta^2b^6-1728s_ms^m\beta^3b^2
\end{aligned}$$

$$\begin{aligned}
d_{10}' := {} & -8(1+2b^2)^2(4s_m^is_i^m\beta b^4+4s_{0|m}^mb^4-2s_ms_0^mnb^2+6s_mr_0^mb^2-4s_0r_m^mb^2+8s_ms^m\beta b^2\\
&-2s_ms_0^mb^2+16s_m^is_i^m\beta b^2+4r_ms_0^mb^2+2s_{m|0}b^mb^2-4s_{0|m}b^mb^2+4s_{0|m}^mb^2+16rs_0b+7s_m^is_i^m\beta\\
&+3s_mr_0^m+2r_ms_0^m+s_{m|0}b^m-4rs_0-2s_0r_m^m-2s_{0|m}b^m+22s_ms^m\beta+2s_ms_0^m+s_{0|m}^m-s_ms_0^mn)
\end{aligned}$$

9. Appendix 4: Coefficients in (7)

$$
\begin{aligned}
d_0^{''} &:= -2592(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta^7,\\
d_2^{''} &:= -2\beta^3(-576c^2\beta^4-144s_0^2\beta^2+4428(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta^2+3456(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta^2b^4+8640(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta^2b^2\\
&\quad +1728s_{0|0}nb^2\beta^2-1152cs_0n\beta^3+576cs_0\beta^3+1944s_{0|0}n\beta^2-4032s_{0|0}b^2\beta^2-2160c_0\beta^3-1728c_0\beta^2b^3\\
&\quad -4824s_{0|0}\beta^2-1296s^m_{\ 0|m}\beta^3)+288\beta^7c^2(11-8n)-24\beta^5(-192c_0\beta b^2+96cs_0n\beta+144c_0n\beta b^2\\
&\quad +120cs_0\beta+198c_0n\beta-276c_0\beta-96c^2b\beta^2+144c^2\beta^2)\\
d_4^{''} &:= 2\beta(1072c^2\beta^4+2592cs_0\beta^3+1728cs_0\beta^3-1476s_0^2\beta^2-1168(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta^2-256(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta^2b^8\\
&\quad -2816(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta^2b^6-6432(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta^2b^4-4880(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta^2b^2+2432c\beta s_0n\beta^2b^2\\
&\quad -256s_{0|0}nb^6\beta^2-2496s_{0|0}nb^2\beta^2-1824s_{0|0}nb^4\beta^2-1728s_ms_0^mn\beta^3b^2-5536s_0^2n\beta^2b^2-256s_0^2n\beta^2b^4\\
&\quad +1664cs_0n\beta^3-2304cs_0\beta^3b^2+256c^2b^4\beta^4-2592cs_0\beta^3+3552s_{0|0}b^4\beta^2+512s_{0|0}\beta^2b^6-878s_{0|0}n\beta^2\\
&\quad +5328s_{0|0}b^2\beta^2+324s^i_ms^m_i\beta^4+1220c_0\beta^3-432s_ms_0^m\beta^2-1728s_0nc\beta^3-1728s^m_{\ 0|m}b^m\beta^3\\
&\quad +864s_{m|0}b^m\beta^3+3456s^m_{\ 0|m}\beta^3b^4+6912s^m_{\ 0|m}b^2\beta^3-576cb^2s_0\beta^3-1512s_ms_0^mn\beta^3+512cs_0n\beta^3b^4\\
&\quad +3168s_ms_0^m\beta^3b^2+2592cs_0\beta^3b^2+1728cs_0\beta^3b^2-2308s_0^2n\beta^2+3936s_0^2\beta^2b^2+384s_0^2\beta^2b^4\\
&\quad +1408c^2b^2\beta^4+3216c_0\beta^3b^2+2112c_0\beta^3b^4+256c_0b^6\beta^3-864s_ms_0^mb^2\beta^2-1728s_0nc\beta^3b^2\\
&\quad -1728s^m_{\ 0|m}b^m\beta^3b^2+864s_{m|0}b^m\beta^3b^2+2218s_{0|0}\beta^2+2880s_ms_0^m\beta^3+2916s^m_{\ 0|m}\beta^3)\\
&\quad -2\beta^3(-2120c_0\beta-2160c^2\beta^2+576c^2b^2\beta^2+1024cs_0n\beta b^4-3200c^2nb^2\beta^2-512c^2b\beta^2b^4\\
&\quad +4288cs_0nb^2\beta+4152c_0n\beta b^2+2400c_0n\beta b^4+256c_0n\beta b^6-1024cs_0b^4\beta-5248cs_0b^2\beta+1384cs_0n\beta\\
&\quad +4352c^2\beta^2b^2+512c^2\beta^2b^4-2768c^2b\beta^2-1728c^2b^2\beta^2+2160c^2n\beta^2+2160c_mb^m\beta^2+3824cs_0\beta\\
&\quad +5360c^2\beta^2+1778c_0n\beta-256c_0b^6\beta-2112c_0b^4\beta-3936c_0\beta b^2+1728c_mb^m\beta^2b^2+1728c^2n\beta^2b^2)\\
&\quad -24\beta^5(-64c^2b^4-512c^2b^2-360c^2+392c^2nb^2+273c^2n+64c^2nb^4)
\end{aligned}
$$

$$
\begin{aligned}
d_6^{''} &:= -1040s_0^2\beta+192c^2\beta^3-72(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta+480\,\mathrm{Ric}\,\beta b^2-384(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta b^8-1152(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta b^6\\
&\quad -1152(\overline{\mathrm{Ric}}-\mathrm{Ric})\beta b^4-480\beta b^2+704cs_0n\beta^2b^2+512cs_0n\beta^2b^4-512s_ms_0^mnb^6\beta^2-256s_{0|0}nb^6\beta\\
&\quad -336s_{0|0}nb^2\beta-528s_{0|0}nb^4\beta-2048cs_0b^4\beta^2-512cs_0b^6\beta^2-2544s_ms_0^mn\beta^2b^2-2496s_ms_0^mn\beta^2b^4\\
&\quad -3424s_0^2n\beta b^2-6304s_0^2n\beta b^4-3584s_0^2n\beta b^6+224cs_0n\beta^2-1760cs_0\beta^2b^2-1664cs_0\beta^2b^4-512cs_0\beta^2b^6\\
&\quad +384c^2b^4\beta^3-672cs_0\beta^2+672s_{0|0}b^2\beta+256s_{0|0}\beta b^6-68s_{0|0}n\beta-1072s_0nc\beta^2+120c_0\beta^2-96s_ms_0^m\beta\\
&\quad +512s^m_{\ 0|m}\beta^2b^8+7104s^m_{\ 0|m}b^4\beta^2+4096s^m_{\ 0|m}\beta^2b^6+4288s^m_{\ 0|m}b^2\beta^2+1296s_ms^m\beta^3\\
&\quad +864s^i_ms^m_i\beta^3-1072s^m_{\ 0|m}b^m\beta^2+536s_{m|0}b^m\beta^2+720s_{0|0}b^4\beta-1184cb^2s_0\beta^2-712s_ms_0^mn\beta^2\\
&\quad +3504s_ms_0^m\beta^2b^2+3072s_ms_0^m\beta^2b^4+768s_ms_0^mb^6\beta^2+5328cs_0b^2\beta^2+4608cs_0\beta^2b^4+768cs_0\beta^2b^6\\
&\quad +3552cs_0b^2\beta^2+3072cs_0\beta^2b^4+512cs_0\beta^2b^6-512s_0^2n\beta+704s_0^2\beta b^2+3776s_0^2\beta b^4+3328s_0^2\beta b^6\\
&\quad +576c^2b^2\beta^3+576c_0\beta^2b^2+864c_0\beta^2b^4+384c_0b^6\beta^2-576s_ms_0^m\beta b^2-1152s_ms_0^m\beta b^4-768s_ms_0^m\beta b^6\\
&\quad -3552s_0ncb^2\beta^2-3072s_0nc\beta^2b^4-512s_0nc\beta^2b^6-3552s^m_{\ 0|m}b^mb^2\beta^2-3072s^m_{\ 0|m}b^m\beta^2b^4\\
&\quad -512s^m_{\ 0|m}b^m\beta^2b^6+1776s_{m|0}b^mb^2\beta^2+1536s_{m|0}b^m\beta^2b^4+256s_{m|0}b^m\beta^2b^6+1728s_ms^m\beta^3b^2\\
&\quad +2592s^i_ms^m_i\beta^3b^2+1728s^i_ms^m_i\beta^3b^4-57+188s_{0|0}\beta+1296s_ms_0^m\beta^2+848s^m_{\ 0|m}\beta^2\\
&\quad -1248cs_0n\beta b^4+1056c^2nb^2\beta^2+1608cs_0\beta^2+1072cs_0\beta^2+2\beta(159c_0\beta+1220c^2\beta^2-1072c^2b^2\beta^2\\
&\quad +576c^2b\beta^2b^4-1392cs_0nb^2\beta-630c_0n\beta b^2-792c_0n\beta b^4-288c_0n\beta b^6+2304cs_0b^4\beta+2880cs_0b^2\beta\\
&\quad -114cs_0n\beta-1824c^2\beta^2b^2-576c^2\beta^2b^4+420c^2b\beta^2-1408c^2b^4\beta^2-256c^2b^6\beta^2+3216c^2b^2\beta^2\\
&\quad +2112c^2b^4\beta^2+256c^2b^6\beta^2-1220c^2n\beta^2-1220c_mb^m\beta^2-1386cs_0\beta-1128c^2\beta^2-153c_0n\beta\\
&\quad +96c_0b^4\beta+312c_0\beta b^2-3216c_mb^m\beta^2b^2-2112c_mb^m\beta^2b^4-256c^2nb^6\beta^2-256c_mb^mb^6\beta^2-3216c^2n\beta^2b^2\\
&\quad -2112c^2n\beta^2b^4)-2\beta^3(-1440c^2b^4-4944c^2b^2+753c^2n-1149c^2+1584c^2nb^4+2712c^2nb^2)
\end{aligned}
$$

$$
d_8^{''} := 8(1+2b^2)^2(4s^i_ms^m_i\beta b^4+4s^m_{\ 0|m}b^4+16s^i_ms^m_i\beta b^2+4s^m_{\ 0|m}b^2-4s_0ncb^2+2s_{m|0}b^mb^2
$$

$$-2s_ms_0^mnb^2-4s^m_{0|m}b^mb^2-2s_ms_0^mb^2+6cs_0b^2+4cs_0b^2+8s_ms^m\beta b^2+s^m_{0|m}+2s_ms_0^m$$
$$+3cs_0+2cs_0-2s^m_{0|m}b^m+s_{m|0}b^m-4cb^2s_0-2s_0nc+7s^i_ms^m_i\beta+22s_ms^m\beta-s_ms_0^mn)$$
$$+120c^2\beta-120c_mb^m\beta+64cs_0b^4+112cs_0b^2-4cs_0n-12c_0nb^2-24c_0nb^4-16c_0nb^6-68cs_0$$
$$-32c^2\beta-2c_0n-32c_0b^6-24c_0b^4-112cs_0nb^4-64cs_0nb^2+32c^2\beta nb^4+32c^2\beta nb^2-576c^2b^4\beta$$
$$-384c^2b^6\beta+576c^2b^2\beta+864c^2b^4\beta+384c^2b^6\beta-32c^2\beta b^4-80c^2\beta b^2+8c^2\beta n-576c_mb^m\beta b^2$$
$$-864c_mb^m\beta b^4-384c^2nb^6\beta-384c_mb^mb^6\beta-192c^2b^2\beta-6c^2n\beta b^2-864c^2n\beta b^4$$
$$+2c_0-120c^2n\beta+2\beta(264c^2b^4+492c^2b^2-24c^2n+36c^2-180c^2nb^4-156c^2nb^2)$$

10. Appendix 5: Coefficients in (9)

$$\begin{aligned}
t'_0 :=\ &-288[10y^iy_jc^2\beta^2+(12y^iy_jcs_0\beta+17y^iy_jc_0\beta+16y^iy_jc_0b^2\beta-16y^iy_jc^2\beta^2+4y^iy_jc^2\beta^2)\\
&+(32y^iy_js_0^2b-20y^iy_jcs_0\beta-8y^iy_js_{0|0}b^2-6y^iy_js_0^2-10y^iy_js_{0|0}-4y^icy_js_0\beta-8y^icy_jc\beta^2\\
&-24y^ic_0y_jb^2\beta-24s^i_{0|0}y_jb^2\beta+9(R^i_j-\overline{R}^i_j)\beta^2-2979s^i_0s_{0j}\beta^2-33y^ic_0y_j\beta-60s^i_{0|0}y_j\beta\\
&+32y^iy_jcs_0b\beta+32y^icy_js_0b\beta+32y^ic^2y_jb\beta^2)]\beta^5\\
t'_2 :=\ &[-48\beta^5(-48\delta^i_jc^2\beta^2+18b^iy_jc^2\beta-36y^ib_jc^2\beta+131y^iy_jc^2+64y^iy_jc^2b^4+222y^iy_jc^2b^2)\\
&-4\beta^3(1152\delta^i_jcs_0b\beta^3+1152\delta^i_jc^2b\beta^4+1270y^iy_jcs_0\beta-1964y^iy_jc^2\beta^2+2700y^iy_jc_0b^2\beta\\
&+1920y^iy_jc_0b^4\beta-720y^ib_jcs_0\beta^2+288y^ib_jc^2\beta^3-288y^ib_jc_0b^2\beta^2-864y^is_jcb^2\beta^2+956y^iy_jc_0\beta\\
&+468b^iy_jc_0\beta^2-36y^ib_jc_0\beta^2+576y^ib_jc^2\beta^3+720y^is_jc\beta^3-576\delta^i_jcs_0\beta^3+960y^ic^2y_j\beta^2\\
&+1728y^ic_jb^2\beta^3-144b^ic^2y_j\beta^3-1404y^is_jc\beta^2-2672y^iy_jc^2b^2\beta^2-3328y^iy_jcs_0b^3\beta+2368y^iy_jcs_0b^2\beta\\
&-976y^iy_jcs_0b\beta-976y^iy_jc^2b\beta^2-3328y^iy_jc^2b^3\beta^2-1024y^iy_jcs_0b^5\beta+1024y^iy_jcs_0b^4\beta+576\delta^i_jc^2\beta^4\\
&-864\delta^i_jc_0b^2\beta^3+2376y^ic_j\beta^3-1188\delta^i_jc_0\beta^3-144b^iy_jc^2\beta^3+288b^iy_jc_0b^2\beta^2+256y^iy_jc_0b^6\beta\\
&-2304y^icb_jcb\beta^3+144b^iy_jcs_0\beta^2-1024y^iy_jc^2b^5\beta^2-512y^iy_jc^2b^4\beta^2-1152b^iy_jcs_0b\beta^2-1152b^iy_jc^2b\beta^3\\
&-1152y^ib_jcs_0b\beta^2-1152y^ib_jc^2b\beta^3+336y^icy_jcb^2\beta^2-2304y^is_jcb\beta^3+288c^2y^iy_jb^2\beta^2+468c^2y^iy_j\beta^2\\
&+486\beta^2s^i_0y_jc)+\beta(9216y^icb_js_0b\beta^4+2976y^iy_js_0^2b^2\beta^2-7104y^iy_js_0^2b\beta^2-6144y^iy_js_0^2b^3\beta^2\\
&+7152y^iy_jcs_0\beta^3-1152y^iy_js_ms_0^mb^2\beta^3+1104y^iy_js_{0|0}b^2\beta^2+384y^iy_js_{0|0}b^4\beta^2-4608b^iy_js_{0|0}b^2\beta^3\\
&+9216y^ib_js_0^2b\beta^3-2304y^ib_jcs_0\beta^4-2304y^ib_js_{0|0}b^2\beta^3+3456y^is_js_0b^2\beta^3+1296s^i_ks^k_0y_j\beta^4+1992y^iy_js_0^2\beta^2\\
&-576y^iy_js_ms_0^m\beta^3+564y^iy_js_{0|0}\beta^2-4464b^iy_js_{0|0}\beta^3-864b^iy_js_0^2\beta^3-2880y^ib_js_{0|0}\beta^3-2304y^icb_js_0\beta^4\\
&-1728y^is_js_0\beta^4+1152y^is_jc\beta^5-4608\delta^i_js_0^2b\beta^4-2304\delta^i_jcs_0\beta^5+3456\delta^i_js_{0|0}b^2\beta^4+3040y^icy_js_0\beta^3\\
&+5536y^ic^2y_j\beta^4+16608y^ic_0y_jb^2\beta^3+9600y^ic_0y_j\beta^3b^4+1024y^ic_0y_jb^6\beta^3-3456y^ics_{0j}b^2\beta^4\\
&+6912y^ics_{j0}b^2\beta^4+3456y^is_{j|0}b^2\beta^4+23040s^i_{0|0}y_jb^2\beta^3+18432s^i_{0|0}y_j\beta^3b^4+3072s^i_{0|0}y_jb^6\beta^3\\
&-6912y^is_{0|j}b^2\beta^4-576b^icy_js_0\beta^4-1152b^ic^2y_j\beta^5-3456b^ic_0y_jb^2\beta^4+5616y^is_js_0\beta^3-4608\delta^i_jcs_0b\beta^5\\
&-8856(R^i_j-\overline{R}^i_j)\beta^4+2931336s^i_0s_{0j}\beta^4+1296s^i_{j|0}\beta^5-2592s^i_{j|0}\beta^5+12096y^iy_jcs_0b^2\beta^3\\
&-7104y^iy_jcs_0b\beta^3-6144y^iy_jcs_0b^3\beta^3+5719680s^i_0s_{0j}b^2\beta^4+2287872s^i_0s_{0j}\beta^4b^4-4320cy^icy_j\beta^4\\
&-7776y^is_{0|j}\beta^4-4320b^ic_0y_j\beta^4-1296s^i_{0|0}b_j\beta^4+3888\delta^i_js_{0|0}\beta^4+7112y^ic_0y_j\beta^3-3888y^ics_{0j}\beta^4\\
&+7776y^ics_{j0}\beta^4+3888y^is_{j|0}\beta^4+7620s^i_{0|0}y_j\beta^3-576b^iy_jcs_0\beta^4+9216b^iy_js_0^2b\beta^3+3072y^iy_jcs_0b^4\beta^3\\
&+9216b^iy_jcs_0b\beta^4+9216y^ib_jcs_0b\beta^4-22144y^icy_js_0b\beta^3-22144y^ic^2y_jb\beta^4+5440y^icy_js_0b^2\beta^3\\
&-25600y^icy_js_0b^3\beta^3+6400y^ic^2y_jb^2\beta^4-25600y^ic^2y_jb^3\beta^4+1024y^icy_js_0\beta^3b^4-4096y^icy_js_0b^5\beta^3\\
&+1024y^ic^2y_jb^4\beta^4-4096y^ic^2y_jb^5\beta^4+4608b^icy_js_0b\beta^4+4608b^ic^2y_jb\beta^5+4608y^is_js_0b\beta^4\\
&-4608y^is_jcb\beta^5-4608cy^iy_js_0b^2\beta^3-3456c^2y^iy_jb^2\beta^4-4464cy^iy_js_0\beta^3-1944\beta^3s^i_0y_js_0\\
&-6912(R^i_j-\overline{R}^i_j)\beta^4b^4-17280(R^i_j-\overline{R}^i_j)\beta^4b^2)]
\end{aligned}$$

$$
\begin{aligned}
t'_4 := {} & [-4\beta^3(-384y^ib_jc^2b^4\beta - 648y^ib_jc^2b^2\beta + 54b^iy_jc^2\beta - 72b^ib_jc^2\beta^2 - 894y^ib_jc^2\beta - 384\delta^i_jc^2b^4\beta^2 \\
& -2352\delta^i_jc^2b^2\beta^2 - 1638\delta^i_jc^2\beta^2 + 504b^iy_jc^2b^2\beta + 207y^iy_jc^2 + 1128y^iy_jc^2b^4 + 1050y^iy_jc^2b^2) \\
& +\beta(-4536\beta^2s^i_0y_jcb^2 - 2592\beta^2s^i_0y_jcb^4 + 8576\delta^i_jcs_0b^2\beta^3 - 11072\delta^i_jcs_0b\beta^3 - 12800\delta^i_jcs_0b^3\beta^3 \\
& -6400\delta^i_jc^2b^2\beta^4 - 11072\delta^i_jc^2b\beta^4 + 24y^iy_jcs_0\beta + 1068y^iy_jc^2\beta^2 - 1524y^iy_jc_0b^2\beta - 2208y^iy_jc_0b^4\beta \\
& +4096y^ic^2b_jb^5\beta^3 + 25600y^icb_jb^3\beta^3 - 288b^ib_jc^2s_0\beta^3 - 576b^ib_jc^2\beta^4 + 1152b^ib_jc_0b^2\beta^3 + 512y^ib_jc_0b^6\beta^2 \\
& +6056y^ib_jcs_0\beta^2 - 2320y^ib_jc^2\beta^3 + 2496y^ib_jc_0b^2\beta^2 + 2880y^ib_jc_0b^4\beta^2 + 2160y^is_jcb^2\beta^2 + 2880g^iy_jc\beta^3b^2 \\
& -1728b^is_jc\beta^3b^2 - 4608b^ic^2b_jb\beta^4 - 330y^iy_jc_0\beta - 684b^iy_jc_0\beta^2 + 1872b^ib_jc_0\beta^3 + 268y^ib_jc_0\beta^2 \\
& +3456\delta^i_jcb^2\beta^4 + 1152b^ic^2b_j\beta^4 - 5536y^ib_jc^2\beta^3 + 1944s^i_0b_jc\beta^3 + 512\delta^i_jc_0b^6\beta^3 + 2768\delta^i_jcs_0\beta^3 \\
& +720b^iy_jc^2\beta^3 - 1440b^iy_jc_0b^2\beta^2 - 576b^iy_jc_0b^4\beta^2 - 960y^iy_jc_0b^6\beta + 22144y^ib_jc^2b\beta^3 - 6400y^ib_jc^2\beta^3b^2 \\
& -1024y^icb_jc\beta^3b^4 + 1440b^is_jc\beta^4 - 6784y^is_jc\beta^3 - 16608y^ic_jb^2\beta^3 - 9600y^ic_j\beta^3b^4 - 1024y^ic_jb^6\beta^3 \\
& +3456b^ic_jb^2\beta^4 - 840y^iy_jc^2\beta^2 + 2592b^iy_jc^2\beta^3 + 3024y^iy_jc^2b^2\beta^2 + 4608y^iy_jcs_0b^3\beta - 1584y^iy_jcs_0b^2\beta \\
& +1200y^iy_jcs_0b\beta + 1200y^iy_jc^2b\beta^2 + 4608y^iy_jc^2b^3\beta^2 + 2052y^is_jc\beta^2 + 2304g^iy_jc\beta^3 - 12800\delta^i_jc^2b^3\beta^4 \\
& +2048\delta^i_jcs_0b^4\beta^3 - 2048\delta^i_jc^2b^5\beta^4 - 2048\delta^i_jcs_0b^5\beta^3 - 1620\beta^2s^i_0y_jc + 3840y^iy_jcs_0b^5\beta \\
& -3264y^iy_jcs_0b^4\beta - 5536\delta^i_jc^2\beta^4 + 8304\delta^i_jc_0b^2\beta^3 + 4800\delta^i_jc_0b^4\beta^3 + 3556\delta^i_jc_0\beta^3 - 3456b^is_jc\beta^3 \\
& +4320b^ic_j\beta^4 - 7112y^ic_j\beta^3 + 1872cy^ib_jc\beta^3 - 1440cy^iy_jcb^2\beta^2 - 576cy^iy_jc\beta^2b^4 + 3816b^iy_jcs_0\beta^2 \\
& +3840y^iy_jc^2b^5\beta^2 + 1920y^iy_jc^2b^4\beta^2 + 288b^iy_jcs_0b^2\beta^2 + 5760b^iy_jcs_0b\beta^2 + 4608b^iy_jcs_0b^3\beta^2 \\
& +576b^iy_jc^2b^2\beta^3 + 5760b^iy_jc^2b\beta^3 + 4608b^iy_jc^2b^3\beta^3 - 4608b^ib_jcs_0b\beta^3 - 4608b^ib_jc^2b\beta^4 \\
& +2336y^ib_jcs_0b^2\beta^2 + 7168y^ib_jcs_0b\beta^2 - 512y^ib_jcs_0b^3\beta^2 - 4288y^ib_jc^2b^2\beta^3 + 7168y^ib_jc^2b\beta^3 \\
& -512y^ib_jc^2b^3\beta^3 + 4320\delta^i_jc\beta^4 - 2048y^ib_jcs_0b^5\beta^2 + 2048y^ib_jcs_0b^4\beta^2 - 2048y^ib_jc^2b^5\beta^3 \\
& -1024y^ib_jc^2b^4\beta^3 - 1024\delta^i_jc^2b^4\beta^4 + 288y^ic^2y_jb^2\beta^2 + 768y^iy_jc^2\beta^2b^4 + 1152b^iy_jc^2\beta^3b^2 \\
& -4608b^is_jcb\beta^4 + 22144y^is_jcb\beta^3 - 6880y^is_jc\beta^3b^2 - 1024y^is_jc\beta^3b^4 + 25600y^is_jcb^3\beta^3 + 4096y^is_jcb^5\beta^3 \\
& +1152c^2y^ib_j\beta^3b^2 - 684c^2y^iy_j\beta^2) - (648s^i_ks^k_j\beta^5 - 773216s^i_0s_{0j}\beta^3 - 2916s^i_{j|0}\beta^4 + 5832s^i_{j|0}\beta^4 \\
& +2720y^is_js_0b^2\beta^3 + 512y^is_js_0\beta^3b^4 + 2384y^is_js_0\beta^3 - 1864192s^i_0s_{0j}b^6\beta^3 - 169472s^i_0s_{0j}\beta^3b^8 \\
& +2440cy^icy_j\beta^3 - 3456b^is_{0|j}\beta^4 - 3456\delta^i_js_0\beta^4 - 3024\delta^i_js_ms^m_0\beta^4 + 1756y^ics_{0j}\beta^3 \\
& +1728s^i_{0|0}b_j\beta^3 - 1728b^ics_{0j}\beta^4 + 1000\delta^i_js^2_0\beta^3 - 3512y^ics_{j0}\beta^3 - 1756y^is_{j|0}\beta^3 - 664s^i_{0|0}y_j\beta^2 \\
& -1756\delta^i_js_{0|0}\beta^3 + 3512y^is_{0|j}\beta^3 + 1728b^is_{j|0}\beta^4 + 1512y^is_ms^m_0\beta^4 - 612y^ic_0y_j\beta^2 + 6912s^i_{j|0}\beta^4b^4 \\
& ++2440b^ic_0y_j\beta^3 - 6912s^i_{j|0}b^2\beta^4 - 3456s^i_{j|0}\beta^4b^4 + 3456b^ics_{j0}\beta^4 + 13824s^i_{j|0}b^2\beta^4 + 1728g^icy_j\beta^4 \\
& -3648y^is_{j|0}\beta^3b^4 - 512y^is_{j|0}b^6\beta^3 - 3680s^i_{0|0}y_jb^2\beta^2 + 3456b^is_js_0\beta^3 - 1476y^is_js_0\beta^2 + 1024y^is_{0|j}b^6\beta^3 \\
& +368b^icy_js_0\beta^3 + 564y^ib_js_{0|0}\beta^2 - 236y^iy_js^2_0\beta + 316y^iy_js_ms^m_0\beta^2 - 4y^iy_js_{0|0}\beta - 7008s^i_{0|0}y_j\beta^2b^4 \\
& -5120s^i_{0|0}y_j\beta^2b^6 - 1024s^i_{0|0}y_j\beta^2b^8 + 1728b^is_{j|0}b^2\beta^4 + 5184s^i_{0|0}b_jb^2\beta^3 + 3456s^i_{0|0}b_j\beta^3b^4 \\
& -1024y^ics_{j0}b^6\beta^3 + 2144b^iy_jc^2\beta^4 - 2736b^ib_js_{0|0}\beta^3 + 9984y^is_{0|j}b^2\beta^3 + 7296y^is_{0|j}\beta^3b^4 \\
& -576y^icy_js_0\beta^2 - 840y^iy_jc^2\beta^3 - 1152b^icb_js_0\beta^4 + 3328y^icb_js_0\beta^3 + 936y^ib_js_ms^m_0\beta^3 + 6432b^ic_0y_jb^2\beta^3 \\
& +4224b^ic_0y_j\beta^3b^4 + 512b^ic_0y_jb^6\beta^3 - 576g^iy_js_0\beta^3 - 2520y^ic_0y_jb^2\beta^2 - 3168y^ic_0y_j\beta^2b^4 - 1152y^ic_0y_j\beta^2b^6 \\
& +4992y^ics_{0j}b^2\beta^3 + 3648y^ics_{0j}\beta^3b^4 + 512y^ics_{0j}b^6\beta^3 - 9984y^ics_{j0}b^2\beta^3 - 7296y^ics_{j0}\beta^3b^4 \\
& +1728y^is_ms^m_0b^2\beta^4 - 512\delta^i_js^2_0b^4\beta^3 + 2048\delta^i_js^2_0b^5\beta^3 - 512\delta^i_js_{0|0}b^6\beta^3 - 3456\delta^i_js_ms^m_0b^2\beta^4 \\
& -704\delta^i_js^2_0b^2\beta^3 + 6656\delta^i_js^2_0b\beta^3 + 9728\delta^i_js^2_0b^3\beta^3 + 3328\delta^i_jc\beta s_0\beta^3 - 3456b^is_{0|j}b^2\beta^4 + 3456b^ics_{j0}b^2\beta^4 \\
& -1664y^is_jc\beta^4 - 3456\delta^i_js_0b^2\beta^4 - 1336b^iy_js^2_0\beta^2 + 2088b^iy_js_ms^m_0\beta^3 + 952b^iy_js_{0|0}\beta^2 - 1392y^ib_js^2_0\beta^2 \\
& +1728g^icy_jb^2\beta^4 - 1728b^ics_{0j}b^2\beta^4 - 4992y^is_{j|0}b^2\beta^3 - 1328y^iy_jcs_0b^2\beta^2 + 128y^iy_jcs_0b\beta^2 \\
& +128y^iy_jcs_0b^3\beta^2 - 256y^iy_jcs_0b^5\beta^2 - 1088y^iy_jcs_0b^4\beta^2 + 1536y^ib_jcs_0b^4\beta^3 + 6912b^ib_jc\beta s_0b\beta^3 \\
& +4800y^ib_jcs_0b^2\beta^3 - 7104y^ib_jcs_0b\beta^3 - 6144y^ib_jcs_0b^3\beta^3 - 2048b^iy_jcs_0b^5\beta^3 + 512b^iy_jcs_0b^4\beta^3 \\
& +-9728b^iy_jcs_0b^3\beta^3 + 1280b^iy_jcs_0b^2\beta^3 - 6080b^iy_jcs_0b\beta^3 - 3456s^i_ks^k_0y_j\beta^3b^4 - 1944s^i_0b_js_0\beta^3
\end{aligned}
$$

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\begin{aligned}
&-4320s^i_k s^k_0 y_j b^2\beta^3 + 2592\beta^2 s^i_0 y_j s_0 b^4 - 864b^i s_j s_0\beta^4 + 3216cy^i y_j s_0 b^2\beta^2 + 2880cy^i y_j s_0\beta^2 b^4\\
&+512cy^i y_j s_0 b^6\beta^2 - 2880cy^i b_j s_0 b^2\beta^3 + 2592\beta^2 s^i_0 y_j s_0 b^2 - 2880y^i s_j s_0 b^2\beta^2 + 1728b^i s_j s_0 b^2\beta^3\\
&+512b^i cy_j s_0\beta^3 b^4 - 2048b^i cy_j s_0 b^5\beta^3 + 576y^i b_j s_m s^m_0 b^2\beta^3 + 4864\delta^i_j cs_0 b^2\beta^4 + 6656\delta^i_j cs_0 b\beta^4\\
&+9728\delta^i_j cs_0 b^3\beta^4 + 2048\delta^i_j cs_0 b^5\beta^4 + 48y^i y_j s_{0|0} b^4\beta + 512b^i y_j s_{0|0}\beta^2 b^6 - 13312y^i cb_j s_0 b\beta^3\\
&-256b^i y_j s^2_0 b^2\beta^2 - 6080b^i y_j s^2_0 b\beta^2 - 9728b^i y_j s^2_0 b^3\beta^2 + 3216b^i y_j s_{0|0} b^2\beta^2 + 2880b^i y_j s_{0|0} b^4\beta^2\\
&+512b^i cy_j c\beta b^4\beta^3 - 2048b^i cy_j cb^5\beta^4 + 4864y^i cb_j s_0 b^2\beta^3 + 960y^i b_j s^2_0 b^2\beta^2 - 7104y^i b_j s^2_0 b\beta^2\\
&+2048y^i s_j cb^5\beta^4 + 64y^i y_j s_{0|0}\beta b^6 + 1104y^i b_j s_{0|0} b^2\beta^2 + 384y^i b_j s_{0|0} b^4\beta^2 - 2048y^i s_j s_0 b^5\beta^3\\
&-512y^i s_j cb^4\beta^4 - 11264b^i y_j c^2 b^3\beta^4 + 1464y^i y_j s_m s^m_0 b^2\beta^2 + 1920y^i y_j s_m s^m_0 b^4\beta^2 - 256y^i y_j s^2_0 b^5\beta\\
&-32y^i y_j s^2_0 b^4\beta - 8576b^i cy_j s_0 b\beta^3 - 1728y^i cy_j s_0\beta^2 b^4 + 4608y^i cy_j s_0 b^5\beta^2 - 1152y^i y_j c^2 b^4\beta^3\\
&+4608y^i y_j c^2 b^5\beta^3 - 488y^i y_j s^2_0 b^2\beta + 128y^i y_j s^2_0 b\beta + 128y^i y_j s^2_0 b^3\beta - 392y^i y_j cs_0\beta^2 - 8576b^i y_j c^2 b\beta^4\\
&+1856b^i cy_j s_0 b^2\beta^3 - 11264b^i cy_j s_0 b^3\beta^3 + 2816b^i y_j c^2 b^2\beta^4 + 512y^i y_j s_m s^m_0 b^6\beta^2 + 8448y^i cy_j s_0 b^3\beta^2\\
&+8448y^i y_j c^2 b^3\beta^3 - 19456y^i cb_j s_0 b^3\beta^3 + 1024y^i cb_j s_0\beta^3 b^4 - 4096y^i cb_j s_0 b^5\beta^3 - 2880b^i b_j s_{0|0} b^2\beta^3\\
&-6656y^i s_j s_0 b\beta^3 + 6656y^i s_j cb\beta^4 - 9728y^i s_j s_0 b^3\beta^3 - 2432y^i s_j cb^2\beta^4 + 9728y^i s_j cb^3\beta^4 - 6144y^i b_j s^2_0 b^3\beta^2\\
&+2160y^i b_j cs_0\beta^3 + 512b^i y_j cs_0\beta^3 + 2880b^i y_j s_m s^m_0 b^2\beta^3 - 1152g^i y_j s_0 b^2\beta^3 + 6912b^i b_j s^2_0 b\beta^3\\
&+2304b^i s_j s_0 b\beta^4 - 2304b^i s_j cb\beta^5 - 2112y^i y_j c^2\beta^3 b^2 + 1024\delta^i_j cs_0 b^4\beta^4 + 3360y^i cy_j s_0 b\beta^2 + 3360y^i cy_j c\beta b\beta^2\\
&-2448y^i cy_j s_0 b^2\beta^2 - 2048b^i y_j s^2_0 b^5\beta^2 + 512b^i y_j s^2_0 b^4\beta^2 + 4608b^i cb_j s_0 b\beta^4 + 1728cy^i s_j b^2\beta^4\\
&+952cy^i y_j s_0\beta^2 - 2736cy^i b_j s_0\beta^3 + 648\beta^2 s^i_0 y_j s_0 + 6432c^2 y^i y_j b^2\beta^3 + 4224c^2 y^i y_j\beta^3 b^4 + 512c^2 y^i y_j b^6\beta^3\\
&-1152y^i s_j s_0\beta^2 b^4 - 1296s^i_k s^k_0 y_j\beta^3 + 1728cy^i s_j\beta^4 + 648s^i_k s^k_0 b_j\beta^4 - 3230560s^i_0 s_{0j} b^2\beta^3\\
&-4257984s^i_0 s_{0j}\beta^3 b^4 + 2336(R^i_j - \overline{R}^i_j)\beta^3 + 9760(R^i_j - \overline{R}^i_j)\beta^3 b^2 + 12864(R^i_j - \overline{R}^i_j)\beta^3 b^4\\
&+5632(R^i_j - \overline{R}^i_j)\beta^3 b^6 + 512(R^i_j - \overline{R}^i_j)\beta^3 b^8)]
\end{aligned}
$$

$$
\begin{aligned}
t'_6 := {}&[\beta(864b^i b_j c^2 b^2\beta^2 + 576y^i b_j c^2 b^4\beta - 1512y^i b_j c^2 b^2\beta - 108b^i y_j c^2\beta - 2376b^i b_j c^2\beta^2 + 162y^i b_j c^2\beta\\
&+5424\delta^i_j c^2 b^2\beta^2 + 3168\delta^i_j c^2 b^4\beta^2 + 1506\delta^i_j c^2\beta^2 - 27y^i y_j c^2 - 504y^i y_j c^2 b^4 - 324y^i y_j c^2 b^2 - 648b^i y_j c^2 b^2\beta)\\
&-(648s^i s_j\beta^3 + 864s^i_k s^k_j\beta^3 - 23832s^i_0 s_{0j}\beta - 424s^i_{j|0}\beta^2 + 848s^i_{j|0}\beta^2 - 4s^i_{0|0} y_j - 4y^i c_0 y_j + 120cy^i cy_j\beta\\
&-12y^i s_j s_0 - 712\delta^i_j s_m s^m_0\beta^2 + 68y^i cs_{0j}\beta + 112s^i_{0|0} b_j\beta - 648b^i s_m s^m_0\beta^3 - 536b^i cs_{0j}\beta^2 - 136y^i cs_{j0}\beta\\
&-68y^i s_{j|0}\beta + 136y^i s_{0|j}\beta + 356y^i s_m s^m_0\beta^2 - 2144s^i_{j|0} b^2\beta^2 - 64s^i_{0|0} y_j b^8 - 128s^i_{0|0} y_j b^6 - 96s^i_{0|0} y_j b^4\\
&-32s^i_{0|0} y_j b^2 - 8y^i cy_j s_0 - 8y^i cy_j c\beta - 48y^i c_0 y_j b^4 - 24y^i c_0 y_j b^2 - 32y^i c_0 y_j b^6 + 7104s^i_{j|0}\beta^2 b^4 + 4y^i y_j s_m s^m_0\\
&+8b^i y_j s_{0|0} + 40b^i y_j s^2_0 + 4y^i b_j s_{0|0} + 20y^i b_j s^2_0 + 536b^i s_{j|0}\beta^2 - 1072\delta^i_j s_0\beta^2 + 4096s^i_{j|0}\beta^2 b^6 + 512s^i_{j|0}\beta^2 b^8\\
&+120b^i c_0 y_j\beta + 80\delta^i_j s^2_0\beta - 1072b^i s_{0|j}\beta^2 - 3552s^i_{j|0}\beta^2 b^4 - 2048s^i_{j|0}\beta^2 b^6 - 256s^i_{j|0}\beta^2 b^8 + 4288s^i_{j|0} b^2\beta^2\\
&+1072b^i cs_{j0}\beta^2 + 536s^i cy_j\beta^2 - 68\delta^i_j s_{0|0}\beta + 144y^i s_j s_0 b^4 + 864b^i s_j s_0\beta + 136y^i s_j s_0\beta - 80s^i y_j s_0\beta\\
&+336y^i cs_{0j} b^2\beta + 528y^i cs_{0j}\beta b^4 + 256y^i cs_{0j}\beta b^6 - 672y^i cs_{j0} b^2\beta - 1056y^i cs_{j0}\beta b^4 - 512y^i cs_{j0}\beta b^6\\
&+32y^i y_j s_m s^m_0 b^6 + 416y^i b_j s^2_0 b^2 + 1248y^i s_m s^m_0\beta^2 b^4 + 256y^i s_m s^m_0\beta^2 b^6 - 256\delta^i_j s_{0|0}\beta b^6\\
&+1024\delta^i_j s^2_0 b^5\beta - 352\delta^i_j s^2_0 b^4\beta - 512\delta^i_j s_m s^m_0 b^6\beta^2 + 448\delta^i_j s^2_0 b\beta + 1408\delta^i_j s^2_0 b^3\beta + 320y^i b_j s^2_0 b^4 + 56y^i b_j c\beta s_0\\
&-512b^i s_{0|j}\beta^2 b^6 - 864b^i s_m s^m_0 b^2\beta^3 + 1536s^i cy_j\beta^2 b^4 + 512b^i cs_{j0}\beta^2 b^6 + 1776s^i cy_j b^2\beta^2 - 1776b^i cs_{0j} b^2\beta^2\\
&-112y^i s_j c\beta^2 - 128y^i b_j s^2_0 b^3 - 3072\delta^i_j s_0\beta^2 b^4 + 152b^i y_j s_m s^m_0\beta + 40y^i b_j s_m s^m_0\beta + 256s^i cy_j\beta^2 b^6\\
&-72s^i b_j s_0\beta^2 - 1536b^i cs_{0j}\beta^2 b^4 - 256y^i s_{j|0}\beta b^6 + 1024b^i b_j cs_0 b^5\beta^2 - 256b^i b_j cs_0 b^4\beta^2 + 3712b^i b_j cs_0 b\beta^2\\
&+5632b^i b_j cs_0 b^3\beta^2 - 256b^i b_j cs_0 b^2\beta^2 - 256s^i_k s^k_0 y_j\beta b^8 - 648s^i_0 b_j s_0\beta - 416s^i_k s^k_0 y_j b^2\beta - 960s^i_k s^k_0 y_j\beta b^4\\
&-896s^i_k s^k_0 y_j\beta b^6 + 72(R^i_j - \overline{R}^i_j)\beta + 1152(R^i_j - \overline{R}^i_j)\beta b^4 + 1152(R^i_j - \overline{R}^i_j)\beta b^6\\
&+480(R^i_j - \overline{R}^i_j)\beta b^2 + 384(R^i_j - \overline{R}^i_j)\beta b^8 - 2592s^i_0 b_j s_0 b^2\beta - 2592s^i_0 b_j s_0\beta b^4 - 1440cy^i b_j s_0 b^2\beta\\
&-1344cy^i b_j s_0\beta b^4 - 256cy^i b_j s_0 b^6\beta - 64y^i b_j s_{0|0} b^6 - 160\delta^i_j s^2_0 b^2\beta - 256b^i y_j s^2_0 b^5 + 64b^i y_j s_{0|0} b^6\\
&+16b^i y_j c\beta s_0 + 64b^i y_j s^2_0 b^4 - 64b^i y_j s^2_0 b + 112b^i y_j s^2_0 b^2 - 256b^i y_j s^2_0 b^3 + 48b^i y_j s_{0|0} b^2 + 96b^i y_j s_{0|0} b^4
\end{aligned}
$$

$$+32y^icy_js_0b-56y^icy_js_0b^2+128y^icy_js_0b^3+32y^iy_jc^2\beta b-32y^ic^2y_jc\beta b^2+128y^iy_jc^2\beta b^3-336y^is_{j|0}b^2\beta$$
$$-528y^is_{j|0}\beta b^4-512\delta^i_js_0b^6\beta^2-1184b^icb_js_0\beta^2+192b^iy_jc^2\beta^2+1056y^is_{0|j}\beta b^4+512y^is_{0|j}\beta b^6$$
$$-3552\delta^i_js_0b^2\beta^2+24y^iy_js_ms^m_0b^2+48y^iy_js_ms^m_0b^4+592b^is_jc\beta^3+1272y^is_ms^m_0b^2\beta^2+224\delta^i_jcs_0\beta^2$$
$$-2544\delta^i_js_ms^m_0b^2\beta^2-2496\delta^i_js_ms^m_0b^4\beta^2-336\delta^i_js_{0|0}b^2\beta-528\delta^i_js_{0|0}b^4\beta+224y^icb_js_0\beta-128y^ib_js^2_0b$$
$$+3072b^ics_{j0}\beta^2b^4-256b^ics_{0j}\beta^2b^6+3552b^ics_{j0}b^2\beta^2+384b^ic_0y_j\beta b^6+1536cy^is_j\beta^2b^4+256cy^is_j\beta^2b^6$$
$$-416cy^ib_js_0\beta+1728s^i_ks^k_0b_jb^2\beta^2+1728s^i_ks^k_0b_j\beta^2b^4+48cy^iy_js_0b^2+96cy^iy_js_0b^4+64cy^iy_js_0b^6$$
$$+576c^2y^iy_jb^2\beta+864c^2y^iy_j\beta b^4+384c^2y^iy_j\beta b^6+1776cy^is_jb^2\beta^2+2592b^is_js_0b^2\beta+1728b^is_js_0\beta b^4$$
$$-384s^iy_js_0b^2\beta+256y^ib_jc\beta s_0b^5+320y^ib_jc\beta s_0b^4-128y^ib_jc\beta s_0b-192y^ib_js_ms^m_0b^2\beta-672y^ib_js_ms^m_0b^4\beta$$
$$+1664b^ib_js^2_0b^2\beta+3712b^ib_js^2_0b\beta+704\delta^i_jc\beta s_0b^2\beta+448\delta^i_jcs_0b\beta^2+1408\delta^i_jcs_0b^3\beta^2-2048y^icb_js_0b^5\beta$$
$$-256b^ib_js_{0|0}\beta b^6+1024b^ib_js^2_0b^5\beta-256b^ib_js^2_0b^4\beta+2368b^is_js_0b\beta^2-2368b^is_jcb\beta^3+1024b^is_jc\beta^3b^2$$
$$-576s^iy_js_0\beta b^4+272y^ib_jc\beta s_0b^2-128y^ib_jc\beta s_0b^3+1408y^is_jcb^3\beta^2-256y^ib_js_ms^m_0b^6\beta-1536b^icy_js_0b^5\beta$$
$$+240b^icy_js_0b^2\beta-768b^icy_js_0b\beta+2304b^icy_js_0b^3\beta+576b^iy_jc^2b^2\beta^2-768b^iy_jc^2b\beta^2-2304b^iy_jc^2b^3\beta^2$$
$$+384b^icy_js_0\beta b^4+384b^iy_jc^2b^4\beta^2-1536b^iy_jc^2b^5\beta^2-2016b^ib_js_ms^m_0b^2\beta^2+64b^iy_jc\beta s_0b^4$$
$$-448y^is_js_0b\beta-1408y^is_js_0b^3\beta-352y^is_jcb^2\beta^2+448y^is_jcb\beta^2-1440b^ib_js_{0|0}b^2\beta-1344b^ib_js_{0|0}b^4\beta$$
$$-256b^iy_jc\beta s_0b^5-64b^iy_jc\beta s_0b+64b^iy_jc\beta s_0b^2-256b^iy_jc\beta s_0b^3+232y^is_js_0b^2\beta+64y^is_js_0\beta b^4$$
$$-1024y^is_js_0b^5\beta-256y^is_jcb^4\beta^2+1024y^is_jcb^5\beta^2+672b^iy_js_ms^m_0b^2\beta+864b^iy_js_ms^m_0b^4\beta$$
$$-256b^is_js_0\beta^2b^4+288s^ib_js_0b^2\beta^2+4736b^icb_js_0b\beta^2-256s^iy_js_0b^6\beta+5632b^ib_js^2_0b^3\beta$$
$$+80b^ib_jcs_0\beta^2-4096b^is_jcb^3\beta^3+1024b^is_js_0b^5\beta^2+256b^is_jcb^4\beta^3-1024b^is_jcb^5\beta^3+4096b^is_js_0b^3\beta^2$$
$$+1024\delta^i_jcs_0b^5\beta^2+512\delta^i_jcs_0b^4\beta^2+256b^iy_js_ms^m_0b^6\beta+8192b^icb_js_0b^3\beta^2-512b^icb_js_0\beta^2b^4+2048b^icb_js_0b^5\beta^2$$
$$+704y^icb_js_0b^2\beta-896y^icb_js_0b\beta-2816y^icb_js_0b^3\beta+512y^icb_js_0\beta b^4-2048b^icb_js_0b^2\beta^2-1408b^is_js_0b^2\beta^2$$
$$-64s^i_ks^k_0y_j\beta+536cy^is_j\beta^2+864s^is_jb^2\beta^3+432s^i_ks^k_0b_j\beta^2+2592s^i_ks^k_jb^2\beta^3+1728s^i_ks^k_j\beta^3b^4$$
$$-158880s^i_0s_{0j}b^2\beta-381312s^i_0s_{0j}\beta b^4-381312s^i_0s_{0j}\beta b^6-127104s^i_0s_{0j}\beta b^8+8cy^iy_js_0+2480b^ib_js^2_0\beta$$
$$-1440b^ib_js_ms^m_0\beta^2-416b^ib_js_{0|0}\beta+192y^is_js_0b^6-48b^icy_js_0\beta-48y^ib_js_{0|0}b^4+576b^ic_0y_jb^2\beta$$
$$+864b^ic_0y_j\beta b^4+256y^ib_js^2_0b^5+672y^is_{0|j}b^2\beta-80y^icy_js_0b^4+128y^icy_js_0b^5-32y^icy_jc\beta b^4$$
$$+128y^icy_jc\beta b^5+1536b^is_{j|0}\beta^2b^4+256b^is_{j|0}\beta^2b^6-3552b^is_{0|j}b^2\beta^2-3072b^is_{0|j}\beta^2b^4-1144b^is_js_0\beta^2$$
$$+704s^i_{0|0}b_jb^2\beta+1536s^i_{0|0}b_j\beta b^4+1280s^i_{0|0}b_j\beta b^6+256s^i_{0|0}b_j\beta b^8+1776b^is_{j|0}b^2\beta^2)$$
$$-(-1620s^i_0b_jc\beta^2+1944y^is_jcb^2\beta^2+864y^is_jc\beta^2b^4-3296b^is_jc\beta^3b^2-512b^is_jc\beta^3b^4+972y^is_jc\beta^2$$
$$-2440b^ic_j\beta^3-306\delta^i_jc_0\beta^2+2y^iy_jc_0-2440\delta^i_jc\beta^3+612y^ic_j\beta^2+1692b^is_jc\beta^2-36y^is_jc\beta-684b^ib_jc_0\beta^2$$
$$-8y^iy_jc^2\beta+12b^iy_jc_0\beta+4y^iy_jcs_0-592g^iy_jc\beta^2+840\delta^i_jc^2\beta^3-1260\delta^i_jc_0b^2\beta^2-1584\delta^i_jc_0b^4\beta^2$$
$$-2144b^ib_jc^2\beta^3-708b^iy_jc^2\beta^2-512\delta^i_jc\beta^3b^6-6432\delta^i_jc\beta^3b^2+24y^iy_jc_0b^4+12y^iy_jc_0b^2+576b^is_jc\beta^5$$
$$-4992\delta^i_js_{0|0}b^2\beta^3-3648\delta^i_js_{0|0}b^4\beta^3+12y^iy_jc^2\beta+840y^ib_jc^2\beta^2-6432b^ic_jb^2\beta^3-4224b^ic_j\beta^3b^4$$
$$-512b^ic_jb^6\beta^3+2520y^ic_jb^2\beta^2+3168y^ic_j\beta^2b^4+1152y^ic_j\beta^2b^6+16y^iy_jc_0b^6-576\delta^i_jc_0b^6\beta^2-228\delta^i_jcs_0\beta^2$$
$$-24y^ib_jc_0\beta-4224\delta^i_jc\beta^3b^4+576g^ib_jc\beta^3-24b^iy_jcs_0b^2\beta-192b^iy_jcs_0b\beta-384b^iy_jcs_0b^3\beta-48b^iy_jc^2b^2\beta^2$$
$$+768y^ib_jc^2b^4\beta^2-480y^ib_jcs_0b\beta+384y^ib_jcs_0b^3\beta+912y^ib_jc^2b^2\beta^2-480y^ib_jc^2b\beta^2+384y^ib_jc^2b^3\beta^2$$
$$+1704y^ib_jcs_0b^2\beta+1536y^ib_jcs_0b^5\beta+96y^ib_jcs_0b^4\beta+1536y^ib_jc^2b^5\beta^2+4608b^ib_jc^2b^3\beta^3+576b^ib_jc^2b^2\beta^3$$
$$+5760b^ib_jc^2b\beta^3+5760b^ib_jcs_0b\beta^2+4608b^ib_jcs_0b^3\beta^2+1728b^ib_jcs_0b^2\beta^2-288b^iy_jcs_0b^4\beta-192b^iy_jc^2b\beta^2$$
$$--384b^iy_jc^2b^3\beta^2+432\beta s^i_0y_jcb^4+288\beta s^i_0y_jcb^6-3032b^is_jc\beta^3-4536s^i_0b_jcb^2\beta^2-2592s^i_0b_jc\beta^2b^4$$
$$+48cy^iy_jcb^2\beta+48cy^iy_jc\beta b^4-1440cy^ib_jcb^2\beta^2-576cy^ib_jc\beta^2b^4+216\beta s^i_0y_jcb^2+216y^is_jcb^2\beta$$
$$+1152b^is_jc\beta^2b^4+3312b^is_jcb^2\beta^2-2208g^iy_jcb^2\beta^2-512g^iy_jcb^6\beta^2-2496\delta^i_jcs_0b^4\beta^2+2304\delta^i_jc^2b^5\beta^3$$
$$+576y^is_jc\beta b^6-576b^ib_jc_0b^4\beta^2+2304\delta^i_jcs_0b^5\beta^2+6480b^ib_jcs_0\beta^2+864y^is_jc\beta b^4+8576b^is_jcb\beta^3$$
$$+11264b^is_jcb^3\beta^3+2048b^is_jcb^5\beta^3+720b^ib_jc^2\beta^3-1440b^ib_jc_0b^2\beta^2-2304g^iy_jc\beta^2b^4+228y^ib_jc^2\beta^2$$
$$-264y^ib_jc_0b^2\beta-24b^iy_jc^2\beta^2+184y^iy_jcs_0b^4-64y^iy_jcs_0b^5-32y^iy_jc^2\beta b^4-64y^iy_jc^2\beta b^5-624y^ib_jc_0b^4\beta$$

$+768b^icy_jcb^2\beta^2+2112\delta^i_jc^2\beta b^2\beta^2+1680\delta^i_jc^2\beta b\beta^2-4608y^is_jcb^5\beta^2+4224\delta^i_jc^2b^3\beta^3$
$-2784\delta^i_jcs_0b^2\beta^2+1680\delta^i_jcs_0b\beta^2+4224\delta^i_jcs_0b^3\beta^2-3360y^is_jcb\beta^2-384y^ib_jc_0b^6\beta-16y^iy_jcs_0b$
$+100y^iy_jcs_0b^2-64y^iy_jcs_0b^3-16y^iy_jc^2\beta b-32y^iy_jc^2\beta b^2-64y^iy_jc^2\beta b^3-144y^ib_jcs_0\beta+48b^iy_jc_0b^2\beta$
$+48b^iy_jc_0b^4\beta-4608y^ib_jc^2b^5\beta^2+1152g^ib_jc\beta^3b^2+8576b^ib_jc^2b\beta^3-8448y^is_jcb^3\beta^2+1152\delta^i_jc^2b^4\beta^3$
$-108y^iy_jc^2b^2\beta-192y^iy_jc^2\beta b^4+2048b^ib_jc^2b^5\beta^3+2112y^ib_jc^2b^2\beta^2-3360y^ib_jc^2b\beta^2-8448y^ib_jc^2b^3\beta^2$
$+1152y^ib_jc^2\beta^2b^4-48b^iy_jcs_0\beta-2816b^ib_jc^2\beta^3b^2-512b^ib_jc^2\beta^3b^4+11264b^ib_jc^2b^3\beta^3+12y^iy_jc^2\beta$
$-684y^ib_jc^2\beta^2+36\beta s^i_0y_jc)]$

$t'_8 := [(4(2b^2+1))(-2s^i_ks^k_0b_j-22s^is_j\beta-14s^i_ks^k_j\beta-2cy^is_j-2b^is_{0|j}+4b^is_{0|j}+2b^ics_{0j}+2\delta^i_js_ms^m_0$
$+12s^i_{0|j}b^4+6s^i_{0|j}b^2+8s^i_{0|j}b^6-24s^i_{j0}b^4-y^is_ms^m_0-2s^icy_j-4b^ics_{j0}+4\delta^i_js_0-16s^i_{j0}b^6$
$-12s^i_{j0}b^2+8b^ics_{0j}b^4+8b^ics_{0j}b^2-16b^ics_{j0}b^4-16b^ics_{j0}b^2-8s^icy_jb^4-8s^icy_jb^2-8b^is_{0|j}b^2$
$+22b^is_ms^m_0\beta+10b^is_js_0-8b^is_{0|j}b^4+2s^ib_js_0+16\delta^i_js_0b^2+16\delta^i_js_0b^4+8b^icb_js_0$
$+8\delta^i_js_ms^m_0b^2+8\delta^i_js_ms^m_0b^4+16b^is_{0|j}b^4-4b^is_jc\beta-4y^is_ms^m_0b^4-4y^is_ms^m_0b^2+16b^ib_js_ms^m_0$
$+16b^is_{0|j}b^2-32b^icb_js_0b-16b^is_js_0b-32b^is_js_0b^3+40b^ib_js_ms^m_0b^2+16b^ib_js_ms^m_0b^4+8b^is_js_0b^2$
$+16b^is_jc\beta b-8b^is_jc\beta b^2+32b^is_jc\beta b^3+16b^icb_js_0b^2+52b^is_ms^m_0b^2\beta+16b^is_ms^m_0\beta b^4-16s^ib_js_0b^4$
$-64b^icb_js_0b^3-2s^i_{j0}+s^i_{0|j}-4s^ib_js_0b^2-8cy^is_jb^4-52s^is_jb^2\beta-16s^is_j\beta b^4-60s^i_ks^k_jb^2\beta-72s^i_ks^k_j\beta b^4$
$-16s^i_ks^k_j\beta b^6-8cy^is_jb^2-24s^i_ks^k_0b_jb^4-12s^i_ks^k_0b_jb^2-16s^i_ks^k_0b_jb^6)-(4y^ic_j-36s^i_0b_jc+36b^is_jc-2\delta^i_jc_0$
$-120b^ic_j\beta-24\delta^i_jc_0b^4-12\delta^i_jc_0b^2-4\delta^i_jcs_0+8\delta^i_jc^2\beta-16\delta^i_jc_0b^6-312b^is_jc\beta-128y^is_jcb^3$
$-128y^is_jcb^5-112\delta^i_jcs_0b^4+64\delta^i_jcs_0b^5+32\delta^i_jc^2\beta b^4+64\delta^i_jc^2\beta b^5+20y^is_jcb^2+16\delta^i_jcs_0b-64\delta^i_jcs_0b^2$
$+64\delta^i_jcs_0b^3+8y^is_jcb^4-48s^iy_jcb^2-120\delta^i_jc\beta-8s^iy_jc+8y^icb_jc+32y^ic_jb^6-12b^icy_jc+8y^is_jc$
$-12b^ib_jc_0+24y^ic_jb^2+144b^is_jcb^2-384b^ic_j\beta b^6+144b^is_jcb^4-576b^ic_jb^2\beta-864b^ic_j\beta b^4-32y^ic^2b_jb$
$+32y^ic^2b_jb^2-128y^ic^2b_jb^3+32y^ic^2b_jb^4-128y^ib_jc^2b^5-32y^is_jcb+408b^ib_jcs_0+24b^ib_jc^2\beta-48b^ib_jc_0b^4$
$-48b^ib_jc_0b^2-192b^icb_jc\beta-64s^iy_jcb^6-96s^iy_jcb^4+56s^ib_jc\beta-576\delta^i_jcb^2\beta-864\delta^i_jc\beta b^4-384\delta^i_jc\beta b^6$
$-216s^i_0b_jcb^2-432s^i_0b_jcb^4-288s^i_0b_jcb^6-48cy^ib_jcb^2-48cy^ib_jcb^4+288b^ib_jcs_0b^4+192b^ib_jcs_0b$
$+528b^ib_jcs_0b^2+384b^ib_jcs_0b^3+768b^is_jcb\beta+192b^ib_jc^2\beta b+48b^ib_jc^2\beta b^2+384b^ib_jc^2\beta b^3$
$+2304b^is_jcb^3\beta+1536b^is_jcb^5\beta+432s^ib_jcb^2\beta+768s^ib_jc\beta b^4+256s^ib_jc\beta b^6+768b^ib_jc^2b\beta$
$+2304b^ib_jc^2b^3\beta-744b^is_jcb^2\beta-384b^icb_jc\beta b^4-576b^icb_jcb^2\beta+1536b^ib_jc^2b^5\beta-384b^is_jc\beta b^4$
$-12y^ib_jc^2-24b^iy_jc^2b^2+16\delta^i_jc^2\beta b+32\delta^i_jc^2\beta b^2+64\delta^i_jc^2\beta b^3)-(-48\delta^i_jc^2\beta+12b^iy_jc^2+9y^ib_jc^2$
$+24b^iy_jc^2b^2+600b^ib_jc^2\beta+48y^ib_jc^2b^4+96y^ib_jc^2b^2-360\delta^i_jc^2b^4\beta-312\delta^i_jc^2b^2\beta+120b^ib_jc^2b^2\beta)]$

11. Appendix 6: Coefficients in (14)

$A_0 := -288\beta^9r^2_{00}(-11+8n),$

$A_1 := 48\beta^8(-54r_{00|0}\beta-104r^2_{00}b^2-295r^2_{00}+80r^2_{00}nb^2+220r^2_{00}n+36r_{00|0}n\beta)$

$A_2 := 24\beta^7(108(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2-144r_{00|0}nb^2\beta+192r_{00}s_0nb\beta-384r_{00}r_0b\beta+192r_{00}r_0nb\beta-96r_{00}s_0n\beta$
$-342r_{00|0}n\beta+192r_{00|0}\beta b^2+120r_{00}s_0\beta-144r_{00}r_0\beta+96r_{00}r_0n\beta-384r_{00}s_0b\beta+492r_{00|0}\beta$
$+1144r^2_{00}+928r^2_{00}b^2+64r^2_{00}b^4-865r^2_{00}n-64r^2_{00}nb^4-712r^2_{00}nb^2)$

$A_3 := -12\beta^6(162\beta^2\theta-384r_{00}s_0nb^2\beta+1696r_{00}s_0nb\beta+512r_{00}s_0nb^3\beta+256r_{00}r_0nb^2\beta+512r_{00}s_0b^2\beta$
$-720r_{00}s_0n\beta-768r_{00}s_0b^3\beta-3168r_{00}s_0b\beta-320r_{00}r_0b^2\beta+848r_{00}r_0n\beta-768r_{00}r_0b^3\beta$
$-3168r_{00}r_0b\beta-1272r_{00|0}nb^2\beta-192r_{00|0}nb^4\beta+1044(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2+1696r_{00}r_0nb\beta$
$+512r_{00}r_0nb^3\beta+576(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^2+512r^2_{00}b^4+3648r^2_{00}b^2-1923r^2_{00}n+1916r_{00|0}\beta$

$$+144r_{0m}r_0^m\beta^2+288r_{0m}s_0^m\beta^2+360s_{0|0}\beta^2+224r_{00|0}\beta b^4+592r_{00}s_0\beta-1360r_{00}r_0\beta$$
$$-1398r_{00|0}n\beta+1568r_{00|0}\beta b^2-2696r_{00}^2nb^2-544r_{00}^2nb^4-288r_{0m}s_0^mn\beta^2-144s_{0|0}n\beta^2$$
$$+2560r_{00}^2-144r_{00}r_m^m\beta^2-144r_{00|m}b^m\beta^2+144r_{0m|0}b^m\beta^2-162n\beta^2\theta)$$

$$A_4:=2\beta^5(3726\beta^2\theta-8896r_{00}s_0nb^2\beta-1024r_{00}s_0n\beta b^4+18976r_{00}s_0nb\beta+12544r_{00}s_0nb^3\beta$$
$$+1024r_{00}s_0n\beta b^5+6272r_{00}r_0nb^2\beta+512r_{00}r_0n\beta b^4+1024r_{00}s_0b^4\beta+10432r_{00}s_0b^2\beta$$
$$-6568r_{00}s_0n\beta-1024r_{00}s_0b^5\beta-15616r_{00}s_0b^3\beta-32608r_{00}s_0b\beta-512r_{00}r_0b^4\beta-8192r_{00}r_0b^2\beta$$
$$+9488r_{00}r_0n\beta-1024r_{00}r_0b^5\beta-15616r_{00}r_0b^3\beta-32608r_{00}r_0b\beta-14232r_{00|0}nb^2\beta-4704r_{00|0}nb^4\beta$$
$$-256r_{00|0}nb^6\beta+2304s_0^2nb\beta^2+2304rr_{00}b\beta^2+1152r_0s_0n\beta^2-8064r_0s_0b\beta^2-3456r_{0m}s_0^mnb^2\beta^2$$
$$-1728s_{0|0}nb^2\beta^2-2592n\beta^2b^2\theta-1728r_{00}r_m^mb^2\beta^2-1728r_{00|m}b^mb^2\beta^2+1728r_{0m|0}b^mb^2\beta^2$$
$$+13068(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2+18976r_{00}r_0nb\beta+12544r_{00}r_0nb^3\beta+1024r_{00}r_0n\beta b^5+2304r_0s_0nb\beta^2$$
$$+15552(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^2+3456(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^4+324\beta^2\sigma+5280r_{00}^2b^4+25296r_{00}^2b^2-8049r_{00}^2n$$
$$+12584r_{00|0}\beta+144s_0^2\beta^2+576r_0^2\beta^2+3888r_{0m}r_0^m\beta^2+6624r_{0m}s_0^m\beta^2+9144s_{0|0}\beta^2$$
$$+1296s_{0|m}^m\beta^3+4800r_{00|0}\beta b^4+256r_{00|0}b^6\beta+640r_{00}s_0\beta-16496r_{00}r_0\beta-9698r_{00|0}n\beta$$
$$+15840r_{00|0}\beta b^2-6912s_0^2b\beta^2-576rr_{00}\beta^2-2304r_0^2b\beta^2+288r_0s_0\beta^2-17112r_{00}^2nb^2-5808r_{00}^2nb^4$$
$$+1728r_{0m}r_0^mb^2\beta^2+2880r_{0m}s_0^mb^2\beta^2-7344r_{0m}s_0^mn\beta^2+4032s_{0|0}b^2\beta^2-3672s_{0|0}n\beta^2+11085r_{00}^2$$
$$-3888r_{00}r_m^m\beta^2-3888r_{00|m}b^m\beta^2+3888r_{0m|0}b^m\beta^2-324n\beta^2\sigma-3726n\beta^2\theta+2592\beta^2b^2\theta)$$

$$A_5:=-3\beta^4(4050\beta^2\theta-9472r_{00}s_0nb^2\beta-2560r_{00}s_0n\beta b^4+13024r_{00}s_0nb\beta+14080r_{00}s_0nb^3\beta$$
$$+2560r_{00}s_0n\beta b^5+7040r_{00}r_0nb^2\beta+1280r_{00}r_0n\beta b^4+2048r_{00}s_0b^4\beta+9536r_{00}s_0b^2\beta$$
$$-3520r_{00}s_0n\beta-1536r_{00}s_0b^5\beta-13056r_{00}s_0b^3\beta-20256r_{00}s_0b\beta-1280r_{00}r_0b^4\beta-9728r_{00}r_0b^2\beta$$
$$+6512r_{00}r_0n\beta-1536r_{00}r_0b^5\beta-13056r_{00}r_0b^3\beta-20256r_{00}r_0b\beta-9768r_{00|0}nb^2\beta-5280r_{00|0}nb^4\beta$$
$$-640r_{00|0}nb^6\beta-256s_0^2n\beta^2b^2+6016s_0^2nb\beta^2+2048s_0^2nb^3\beta^2-512rr_{00}b^2\beta^2+6400rr_{00}b\beta^2$$
$$+2048rr_{00}b^3\beta^2+3008r_0s_0n\beta^2+512r_0s_0\beta^2b^2-20352r_0s_0b\beta^2-6144r_0s_0b^3\beta^2-9024r_{0m}s_0^mnb^2\beta^2$$
$$-1536r_{0m}s_0^mnb^4\beta^2-4512s_{0|0}nb^2\beta^2-768s_{0|0}nb^4\beta^2-6048n\beta^2b^2\theta-4800r_{00}r_m^mb^2\beta^2$$
$$-768r_{00}r_m^mb^4\beta^2-4800r_{00|m}b^mb^2\beta^2-768r_{00|m}b^mb^4\beta^2+4800r_{0m|0}b^mb^2\beta^2$$
$$+768r_{0m|0}b^mb^4\beta^2+10316(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2+13024r_{00}r_0nb\beta+14080r_{00}r_0nb^3\beta+2560r_{00}r_0n\beta b^5$$
$$+1024r_0s_0n\beta^2b^2+6016r_0s_0nb\beta^2+2048r_0s_0nb^3\beta^2+1024(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^6+19776(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^2$$
$$+9600(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^4+612\beta^2\sigma+3488r_{00}^2b^4-1728n\beta^2b^4\theta+12728r_{00}^2b^2-2461r_{00}^2n$$
$$+5710r_{00|0}\beta-1648s_0^2\beta^2+1600r_0^2\beta^2+4944r_{0m}r_0^m\beta^2+6880r_{0m}s_0^m\beta^2+10856s_{0|0}\beta^2$$
$$+1152s_ms_0^m\beta^3+864s_mr_0^m\beta^3+576r_ms_0^m\beta^3+3744s_{0|m}^m\beta^3+4416r_{00|0}\beta b^4+512r_{00|0}b^6\beta$$
$$-4240r_{00}s_0\beta-12464r_{00}r_0\beta-4670r_{00|0}n\beta+9504r_{00|0}\beta b^2+544s_0^2n\beta^2+640s_0^2\beta^2b^2-16384s_0^2b\beta^2$$
$$-5120s_0^2b^3\beta^2-1600rr_{00}\beta^2+512r_0^2b^2\beta^2-6400r_0^2b\beta^2-2048r_0^2b^3\beta^2-416r_0s_0\beta^2$$
$$-7432r_{00}^2nb^2-3760r_{00}^2nb^4+4800r_{0m}r_0^mb^2\beta^2+768r_{0m}r_0^mb^4\beta^2+6208r_{0m}s_0^mb^2\beta^2$$
$$+1024r_{0m}s_0^mb^4\beta^2-8736r_{0m}s_0^mn\beta^2+10304s_{0|0}b^2\beta^2+1664s_{0|0}b^4\beta^2-4368s_{0|0}n\beta^2$$
$$-576s_ms_0^mn\beta^3+3593r_{00}^2-4944r_{00}r_m^m\beta^2-4944r_{00|m}b^m\beta^2+4944r_{0m|0}b^m\beta^2-216s_ms_0^m\beta^2$$
$$-576s_0r_m^m\beta^3-576s_{0|m}b^m\beta^3+288s_{m|0}b^m\beta^3+2304s_{0|m}^mb^2\beta^3+1728\beta^2b^4\theta-612n\beta^2\sigma$$
$$-4050n\beta^2\theta+6048\beta^2b^2\theta+576\beta^2b^2\sigma-576n\beta^2b^2\sigma)$$

$$A_6:=\beta^3(-2304n\beta^2b^6\theta+11061\beta^2\theta-1728n\beta^2b^4\sigma-24672r_{00}s_0nb^2\beta-11712r_{00}s_0n\beta b^4$$
$$+24336r_{00}s_0nb\beta+38016r_{00}s_0nb^3\beta+11520r_{00}s_0n\beta b^5+19008r_{00}r_0nb^2\beta+5760r_{00}r_0n\beta b^4$$
$$+6912r_{00}s_0b^4\beta+21600r_{00}s_0b^2\beta-4980r_{00}s_0n\beta-768r_{00}s_0b^5\beta-20352r_{00}s_0b^3\beta$$
$$-33744r_{00}s_0b\beta-5760r_{00}r_0b^4\beta-28224r_{00}r_0b^2\beta+12168r_{00}r_0n\beta-768r_{00}r_0b^5\beta-20352r_{00}r_0b^3\beta$$
$$-33744r_{00}r_0b\beta-18252r_{00|0}nb^2\beta-14256r_{00|0}nb^4\beta-2880r_{00|0}nb^6\beta+1216s_0^2n\beta^2b^2$$

$$-512s_0^2n\beta^2b^4+28928s_0^2nb\beta^2+22016s_0^2nb^3\beta^2+2048s_0^2nb^5\beta^2-5888rr_{00}b^2\beta^2$$
$$-512rr_{00}b^4\beta^2+33152rr_{00}b\beta^2+23552rr_{00}b^3\beta^2+2048rr_{00}b^5\beta^2+14464r_0s_0n\beta^2$$
$$-1344r_0s_0\beta^2b^2+768r_0s_0\beta^2b^4-94016r_0s_0b\beta^2-60416r_0s_0b^3\beta^2-5120r_0s_0b^5\beta^2$$
$$-43392r_{0m}s_0^mnb^2\beta^2-16512r_{0m}s_0^mnb^4\beta^2-1024r_{0m}s_0^mn\beta^2b^6-21696s_{0|0}nb^2\beta^2-8256s_{0|0}nb^4\beta^2$$
$$-512s_{0|0}n\beta^2b^6+4608rs_0b\beta^3-26352n\beta^2b^2\theta-3456s_ms_0^mn\beta^3b^2-24864r_{00}r_m^mb^2\beta^2-8832r_{00}r_m^mb^4\beta^2$$
$$-512r_{00}r_m^mb^6\beta^2-24864r_{00|m}b^mb^2\beta^2-8832r_{00|m}b^mb^4\beta^2-512r_{00|m}b^mb^6\beta^2+24864r_{0m|0}b^mb^2\beta^2$$
$$+8832r_{0m|0}b^mb^4\beta^2+512r_{0m|0}b^mb^6\beta^2-1728s_ms_0^mb^2\beta^2-3456s_0r_m^m\beta^3b^2-3456s_{0|m}b^m\beta^3b^2$$
$$+1728s_{m|0}b^m\beta^3b^2+22976(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2+24336r_{00}r_0nb\beta+38016r_{00}r_0nb^3\beta+11520r_{00}r_0n\beta b^5$$
$$+11008r_0s_0n\beta^2b^2+1024r_0s_0n\beta^2b^4+28928r_0s_0nb\beta^2+22016r_0s_0nb^3\beta^2+2048r_0s_0nb^5\beta^2$$
$$+11776(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^6+512(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^8+62752(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^2+49728(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^4$$
$$+2214\beta^2\sigma+6672r_{00}^2b^4-16416n\beta^2b^4\theta+19272r_{00}^2b^2-2256r_{00}^2n+7554r_{00|0}\beta-20616s_0^2\beta^2$$
$$+8288r_0^2\beta^2+15688r_{0m}r_0^m\beta^2+16912r_{0m}s_0^m\beta^2+31988s_{0|0}\beta^2+12672s_ms_0^m\beta^3+10368s_mr_0^m\beta^3$$
$$++6912r_ms_0^m\beta^3+20520s_{0|m}^m\beta^3+8640r_{00|0}\beta b^4+1536r_{00|0}b^6\beta-18036r_{00}s_0\beta-26064r_{00}r_0\beta$$
$$-6570r_{00|0}n\beta+14832r_{00|0}\beta b^2+5560s_0^2n\beta^2-2112s_0^2\beta^2b^2+768s_0^2\beta^2b^4-69568s_0^2b\beta^2-43264s_0^2b^3\beta^2$$
$$-4096s_0^2b^5\beta^2-8288rr_{00}\beta^2+5888r_0^2b^2\beta^2+512r_0^2b^4\beta^2-33152r_0^2b\beta^2-23552r_0^2b^3\beta^2$$
$$-2048r_0^2b^5\beta^2-8640r_0s_0\beta^2-9240r_{00}^2nb^2-6504r_{00}^2nb^4+24864r_{0m}r_0^mb^2\beta^2+8832r_{0m}r_0^mb^4\beta^2$$
$$+512r_{0m}r_0^mb^6\beta^2+21984r_{0m}s_0^mb^2\beta^2+7680r_{0m}s_0^mb^4\beta^2+512r_{0m}s_0^mb^6\beta^2+1728\beta^2b^4\sigma$$
$$-25688r_{0m}s_0^mn\beta^2+48288s_{0|0}b^2\beta^2+17088s_{0|0}b^4\beta^2+1024s_{0|0}b^6\beta^2-12844s_{0|0}n\beta^2$$
$$-1152rs_0\beta^3-6480s_ms_0^mn\beta^3+6336s_ms_0^m\beta^3b^2+5184s_mr_0^m\beta^3b^2+3456r_ms_0^m\beta^3b^2+3504r_{00}^2$$
$$-15688r_{00}r_m^m\beta^2-15688r_{00|m}b^m\beta^2+15688r_{0m|0}b^m\beta^2-2160s_ms_0^m\beta^2-6912s_0r_m^m\beta^3$$
$$-6912s_{0|m}b^m\beta^3+3456s_{m|0}b^m\beta^3+27648s_{0|m}^mb^2\beta^3+6912s_{0|m}^mb^4\beta^3+648s_m^is_i^m\beta^4$$
$$+16416\beta^2b^4\theta-2214n\beta^2\sigma-11061n\beta^2\theta+26352\beta^2b^2\theta+4320\beta^2b^2\sigma+2304\beta^2b^6\theta-4320n\beta^2b^2\sigma)$$

$$A_7:=-\beta^2(-6528n\beta^2b^6\theta+6171\beta^2\theta-3744n\beta^2b^4\sigma-12864r_{00}s_0nb^2\beta-9408r_{00}s_0n\beta b^4+9408r_{00}s_0nb\beta$$
$$+19776r_{00}s_0nb^3\beta+8832r_{00}s_0n\beta b^5+9888r_{00}r_0nb^2\beta+4416r_{00}r_0n\beta b^4+3840r_{00}s_0b^4\beta$$
$$+10896r_{00}s_0b^2\beta-1488r_{00}s_0n\beta+5760r_{00}s_0b^5\beta-1152r_{00}s_0b^3\beta-11520r_{00}s_0b\beta-4416r_{00}r_0b^4\beta$$
$$-16080r_{00}r_0b^2\beta+4704r_{00}r_0n\beta+5760r_{00}r_0b^5\beta-1152r_{00}r_0b^3\beta-11520r_{00}r_0b\beta-7056r_{00|0}nb^2\beta$$
$$-7416r_{00|0}nb^4\beta-2208r_{00|0}nb^6\beta+8128s_0^2n\beta^2b^2+2944s_0^2n\beta^2b^4+24608s_0^2nb\beta^2+31232s_0^2nb^3\beta^2$$
$$+6656s_0^2nb^5\beta^2-9088rr_{00}b^2\beta^2-1792rr_{00}b^4\beta^2+30784rr_{00}b\beta^2+36352rr_{00}b^3\beta^2+7168rr_{00}b^5\beta^2$$
$$+12304r_0s_0n\beta^2-13664r_0s_0\beta^2b^2-2432r_0s_0\beta^2b^4-76512r_0s_0b\beta^2-75264r_0s_0b^3\beta^2-13824r_0s_0b^5\beta^2$$
$$-36912r_{0m}s_0^mnb^2\beta^2-23424r_{0m}s_0^mnb^4\beta^2-3328r_{0m}s_0^mn\beta^2b^6-18456s_{0|0}nb^2\beta^2-11712s_{0|0}nb^4\beta^2$$
$$-1664s_{0|0}n\beta^2b^6-1536rs_0\beta^3b^2+16896rs_0b\beta^3+6144rs_0\beta^3b^3-20712n\beta^2b^2\theta-11808s_ms_0^mn\beta^3b^2$$
$$-2304s_ms_0^mn\beta^3b^4-23088r_{00}r_m^mb^2\beta^2-13632r_{00}r_m^mb^4\beta^2-1792r_{00}r_m^mb^6\beta^2-23088r_{00|m}b^mb^2\beta^2$$
$$-13632r_{00|m}b^mb^4\beta^2-1792r_{00|m}b^mb^6\beta^2+23088r_{0m|0}b^mb^2\beta^2+13632r_{0m|0}b^mb^4\beta^2$$
$$+1792r_{0m|0}b^mb^6\beta^2-5184s_ms_0^mb^2\beta^2-1728s_ms_0^mb^4\beta^2-12672s_0r_m^m\beta^3b^2-2304s_0r_m^m\beta^3b^4$$
$$-12672s_{0|m}b^m\beta^3b^2-2304s_{0|m}b^m\beta^3b^4+6336s_{m|0}b^m\beta^3b^2+1152s_{m|0}b^m\beta^3b^4+1728s_m^is_i^m\beta^4b^2$$
$$+11116(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2+9408r_{00}r_0nb\beta+19776r_{00}r_0nb^3\beta+8832r_{00}r_0n\beta b^5+15616r_0s_0n\beta^2b^2$$
$$+3328r_0s_0n\beta^2b^4+24608r_0s_0nb\beta^2+31232r_0s_0nb^3\beta^2+6656r_0s_0nb^5\beta^2+18176(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^6$$
$$+1792(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^8+40352(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^2+46176(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^4-384n\beta^2b^8\theta-768n\beta^2b^6\sigma$$
$$+1473\beta^2\sigma+2760r_{00}^2b^4-20880n\beta^2b^4\theta+6264r_{00}^2b^2-450r_{00}^2n+2172r_{00|0}\beta-31588s_0^2\beta^2$$
$$+7696r_0^2\beta^2+10088r_{0m}r_0^m\beta^2+7872r_{0m}s_0^m\beta^2+19068s_{0|0}\beta^2+18816s_ms_0^m\beta^3+17064s_mr_0^m\beta^3$$
$$+11376r_ms_0^m\beta^3+20688s_{0|m}^m\beta^3+2376r_{00|0}\beta b^4+384r_{00|0}b^6\beta-11712r_{00}s_0\beta-11472r_{00}r_0\beta$$
$$-2004r_{00|0}n\beta+4464r_{00|0}\beta b^2+7396s_0^2n\beta^2-19264s_0^2\beta^2b^2-4480s_0^2\beta^2b^4-50592s_0^2b\beta^2-40320s_0^2b^3\beta^2$$

$$
\begin{aligned}
&-6144s_0^2b^5\beta^2-7696rr_{00}\beta^2+9088r_0^2b^2\beta^2+1792r_0^2b^4\beta^2-30784r_0^2b\beta^2-36352r_0^2b^3\beta^2\\
&-7168r_0^2b^5\beta^2-13856r_0s_0\beta^2-2400r_{00}^2nb^2-2244r_{00}^2nb^4+23088r_{0m}r_0^mb^2\beta^2+13632r_{0m}r_0^mb^4\beta^2\\
&+1792r_{0m}r_0^mb^6\beta^2+10512r_{0m}s_0^mb^2\beta^2+4608r_{0m}s_0^mb^4\beta^2+768r_{0m}s_0^mb^6\beta^2-15176r_{0m}s_0^mn\beta^2\\
&+39888s_{0|0}b^2\beta^2+22752s_{0|0}b^4\beta^2+3072s_{0|0}b^6\beta^2-7588s_{0|0}n\beta^2-4224rs_0\beta^3-9864s_ms_0^mn\beta^3\\
&+20544s_ms_0^m\beta^3b^2+3840s_ms_0^m\beta^3b^4+19008s_mr_0^m\beta^3b^2+3456s_mr_0^m\beta^3b^4+12672r_ms_0^m\beta^3b^2\\
&+2304r_ms_0^m\beta^3b^4+714r_{00}^2+864s_ms^m\beta^4-10088r_{00}r_m^m\beta^2-10088r_{00|m}b^m\beta^2+10088r_{0m|0}b^m\beta^2\\
&-2808s_ms_0^m\beta^2-11376s_0r_m^m\beta^3-11376s_{0|m}b^m\beta^3+5688s_{m|0}b^m\beta^3+45504s_{0|m}^mb^2\beta^3+25344s_{0|m}^mb^4\beta^3\\
&+3072s_{0|m}^m\beta^3b^6+2484s_m^is_i^m\beta^4+3744\beta^2b^4\sigma+20880\beta^2b^4\theta+768\beta^2b^6\sigma-1473n\beta^2\sigma\\
&-6171n\beta^2\theta+20712\beta^2b^2\theta+4464\beta^2b^2\sigma+6528\beta^2b^6\theta+384\beta^2b^8\theta-4464n\beta^2b^2\sigma)
\end{aligned}
$$

$$
\begin{aligned}
A_8:=\;&2\beta(-3552n\beta^2b^6\theta+1083\beta^2\theta-1608n\beta^2b^4\sigma-2064r_{00}s_0nb^2\beta-2136r_{00}s_0n\beta b^4+1104r_{00}s_0nb\beta\\
&+2976r_{00}s_0nb^3\beta+1824r_{00}s_0n\beta b^5+1488r_{00}r_0nb^2\beta+912r_{00}r_0n\beta b^4+672r_{00}s_0b^4\beta+2040r_{00}s_0b^2\beta\\
&-156r_{00}s_0n\beta+2976r_{00}s_0b^5\beta+1536r_{00}s_0b^3\beta-1200r_{00}s_0b\beta-912r_{00}r_0b^4\beta-2712r_{00}r_0b^2\beta\\
&+552r_{00}r_0n\beta+2976r_{00}r_0b^5\beta+1536r_{00}r_0b^3\beta-1200r_{00}r_0b\beta-828r_{00|0}nb^2\beta-1116r_{00|0}nb^4\beta\\
&-456r_{00|0}nb^6\beta+5360s_0^2n\beta^2b^2+5168s_0^2n\beta^2b^4+6016s_0^2nb\beta^2+11200s_0^2nb^3\beta^2+4096s_0^2nb^5\beta^2\\
&-3616rr_{00}b^2\beta^2-1216rr_{00}b^4\beta^2+8320rr_{00}b\beta^2+14464rr_{00}b^3\beta^2+4864rr_{00}b^5\beta^2+3008r_0s_0n\beta^2\\
&-9840r_0s_0\beta^2b^2-5376r_0s_0\beta^2b^4-17920r_0s_0b\beta^2-22144r_0s_0b^3\beta^2-6016r_0s_0b^5\beta^2-9024r_{0m}s_0^mnb^2\beta^2\\
&-8400r_{0m}s_0^mnb^4\beta^2-2048r_{0m}s_0^mn\beta^2b^6-4512s_{0|0}nb^2\beta^2-4200s_{0|0}nb^4\beta^2-1024s_{0|0}n\beta^2b^6\\
&-2560rs_0\beta^3b^2+12352rs_0b\beta^3+10240rs_0\beta^3b^3-4776n\beta^2b^2\theta+1024rs_0\beta^3b^5-256rs_0\beta^3b^4\\
&+64\beta^2b^8\sigma-7896s_ms_0^mn\beta^3b^2-3552s_ms_0^mn\beta^3b^4-6240r_{00}r_m^mb^2\beta^2-5424r_{00}r_m^mb^4\beta^2\\
&-1216r_{00}r_m^mb^6\beta^2-6240r_{00|m}b^mb^2\beta^2-5424r_{00|m}b^mb^4\beta^2-1216r_{00|m}b^mb^6\beta^2+6240r_{0m|0}b^mb^2\beta^2\\
&+5424r_{0m|0}b^mb^4\beta^2+1216r_{0m|0}b^mb^6\beta^2-2880s_ms_0^mb^2\beta^2-2304s_ms_0^mb^4\beta^2-9264s_0r_m^m\beta^3b^2\\
&-3840s_0r_m^m\beta^3b^4-9264s_{0|m}b^m\beta^3b^2-3840s_{0|m}b^m\beta^3b^4+4632s_{m|0}b^m\beta^3b^2+1920s_{m|0}b^m\beta^3b^4\\
&+3024s_m^is_i^m\beta^4b^2+1756(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2+1104r_{00}r_0nb\beta+2976r_{00}r_0nb^3\beta+1824r_{00}r_0n\beta b^5\\
&+5600r_0s_0n\beta^2b^2+2048r_0s_0n\beta^2b^4+6016r_0s_0nb\beta^2+11200r_0s_0nb^3\beta^2+4096r_0s_0nb^5\beta^2\\
&+7232(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^6+1216(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^8+8096(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^2+12480(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^4\\
&-480n\beta^2b^8\theta-64n\beta^2b^8\sigma-704n\beta^2b^6\sigma+292\beta^2\sigma+384s_mr_0^m\beta^3b^6+336r_{00}^2b^4-6876n\beta^2b^4\theta\\
&+588r_{00}^2b^2-27r_{00}^2n+198r_{00|0}\beta-12176s_0^2\beta^2+2080r_0^2\beta^2+2024r_{0m}r_0^m\beta^2+1040r_{0m}s_0^m\beta^2\\
&+3556s_{0|0}\beta^2+7368s_ms_0^m\beta^3+7500s_mr_0^m\beta^3+5000r_ms_0^m\beta^3+6316s_{0|m}^m\beta^3-36r_{00|0}\beta b^4\\
&-144r_{00|0}b^6\beta-2100r_{00}s_0\beta-1560r_{00}r_0\beta-192r_{00|0}n\beta+360r_{00|0}\beta b^2+2448s_0^2n\beta^2-14208s_0^2\beta^2b^2\\
&-8352s_0^2\beta^2b^4-10240s_0^2b\beta^2-5120s_0^2b^3\beta^2+2176s_0^2b^5\beta^2-2080rr_{00}\beta^2+3616r_0^2b^2\beta^2+1216r_0^2b^4\beta^2\\
&-8320r_0^2b\beta^2-14464r_0^2b^3\beta^2-4864r_0^2b^5\beta^2-5168r_0s_0\beta^2-180r_{00}^2nb^2-216r_{00}^2nb^4+6240r_{0m}r_0^mb^2\beta^2\\
&+5424r_{0m}r_0^mb^4\beta^2+1216r_{0m}r_0^mb^6\beta^2+192r_{0m}s_0^mb^2\beta^2-1344r_{0m}s_0^mb^4\beta^2-320r_{0m}s_0^mb^6\beta^2\\
&-2776r_{0m}s_0^mn\beta^2+9456s_{0|0}b^2\beta^2+7464s_{0|0}b^4\beta^2+1664s_{0|0}b^6\beta^2-1388s_{0|0}n\beta^2-3088rs_0\beta^3\\
&-3956s_ms_0^mn\beta^3+12792s_ms_0^m\beta^3b^2+5376s_ms_0^m\beta^3b^4+13896s_mr_0^m\beta^3b^2+5760s_mr_0^m\beta^3b^4\\
&+9264r_ms_0^m\beta^3b^2+3840r_ms_0^m\beta^3b^4+39r_{00}^2+1512s_ms^m\beta^4-2024r_{00}r_m^m\beta^2-2024r_{00|m}b^m\beta^2\\
&+2024r_{0m|0}b^m\beta^2-912s_ms_0^m\beta^2-5000s_0r_m^m\beta^3-5000s_{0|m}b^m\beta^3+2500s_{m|0}b^m\beta^3+20000s_{0|m}^mb^2\beta^3\\
&+18528s_{0|m}^mb^4\beta^3+5120s_{0|m}^m\beta^3b^6+1944s_m^is_i^m\beta^4-384s_ms_0^m\beta^2b^6+1608\beta^2b^4\sigma+6876\beta^2b^4\theta\\
&+256s_{0|m}^m\beta^3b^8-1408s_0^2\beta^2b^6+704\beta^2b^6\sigma-292n\beta^2\sigma-1083n\beta^2\theta+4776\beta^2b^2\theta\\
&+1220\beta^2b^2\sigma+3552\beta^2b^6\theta+512s_0^2\beta^2b^7+480\beta^2b^8\theta-256s_0r_m^m\beta^3b^6-256s_{0|m}b^m\beta^3b^6\\
&+128s_{m|0}b^m\beta^3b^6-1220n\beta^2b^2\sigma+384s_ms_0^mb^6\beta^3+864s_ms^mb^2\beta^4+864s_m^is_i^m\beta^4b^4\\
&+1280s_0^2nb^6\beta^2-256s_ms_0^mn\beta^3b^6-640r_0s_0b^6\beta^2+256r_ms_0^m\beta^3b^6)
\end{aligned}
$$

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\begin{aligned}
A_9 :=\ & 3744n\beta^2b^6\theta + 128s_ms_0^mb^8\beta^2 - 468\beta^2\theta + 1368n\beta^2b^4\sigma + 768r_{00}s_0nb^2\beta + 1056r_{00}s_0n\beta b^4\\
& -288r_{00}s_0nb\beta - 960r_{00}s_0nb^3\beta - 768r_{00}s_0n\beta b^5 - 480r_{00}r_0nb^2\beta - 384r_{00}r_0n\beta b^4 - 384r_{00}s_0b^4\beta\\
& -1008r_{00}s_0b^2\beta + 48r_{00}s_0n\beta - 2304r_{00}s_0b^5\beta - 1152r_{00}s_0b^3\beta + 288r_{00}s_0b\beta + 384r_{00}r_0b^4\beta\\
& +1008r_{00}r_0b^2\beta - 144r_{00}r_0n\beta - 2304r_{00}r_0b^5\beta - 1152r_{00}r_0b^3\beta + 288r_{00}r_0b\beta + 216r_{00|0}nb^2\beta\\
& +360r_{00|0}nb^4\beta + 192r_{00|0}nb^6\beta - 5888s_0^2n\beta^2b^2 - 10288s_0^2n\beta^2b^4 - 3392s_0^2nb\beta^2 - 8576s_0^2nb^3\beta^2\\
& -4736s_0^2nb^5\beta^2 + 3136rr_{00}b^2\beta^2 + 1600rr_{00}b^4\beta^2 - 5248rr_{00}b\beta^2 - 12544rr_{00}b^3\beta^2 - 6400rr_{00}b^5\beta^2\\
& -1696r_0s_0n\beta^2 + 11744r_0s_0\beta^2b^2 + 11840r_0s_0\beta^2b^4 + 9792r_0s_0b\beta^2 + 12288r_0s_0b^3\beta^2 + 2688r_0s_0b^5\beta^2\\
& +5088r_{0m}s_0^mnb^2\beta^2 + 6432r_{0m}s_0^mnb^4\beta^2 + 2368r_{0m}s_0^mn\beta^2b^6 + 2544s_{0|0}nb^2\beta^2 + 3216s_{0|0}nb^4\beta^2\\
& +1184s_{0|0}n\beta^2b^6 + 6528rs_0\beta^3b^2 - 18432rs_0b\beta^3 - 26112rs_0\beta^3b^3 + 2592n\beta^2b^2\theta - 6144rs_0\beta^3b^5\\
& +1536rs_0\beta^3b^4 - 192\beta^2b^8\sigma + 10560s_ms_0^mn\beta^3b^2 + 8160s_ms_0^mn\beta^3b^4 + 3936r_{00}r_m^mb^2\beta^2 + 4704r_{00}r_m^mb^4\beta^2\\
& +1600r_{00}r_m^mb^6\beta^2 + 3936r_{00|m}b^mb^2\beta^2 + 4704r_{00|m}b^mb^4\beta^2 + 1600r_{00|m}b^mb^6\beta^2 - 3936r_{0m|0}b^mb^2\beta^2\\
& -4704r_{0m|0}b^mb^4\beta^2 - 1600r_{0m|0}b^mb^6\beta^2 + 2944s_ms_0^mb^2\beta^2 + 4224s_ms_0^mb^4\beta^2 + 13824s_0r_m^m\beta^3b^2\\
& +9792s_0r_m^m\beta^3b^4 + 13824s_{0|m}b^m\beta^3b^2 + 9792s_{0|m}b^m\beta^3b^4 - 6912s_{m|0}b^m\beta^3b^2 - 4896s_{m|0}b^m\beta^3b^4\\
& -8352s_m^is_i^m\beta^4b^2 - 700(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2 - 288r_{00}r_0nb\beta - 960r_{00}r_0nb^3\beta - 768r_{00}r_0n\beta b^5\\
& -4288r_0s_0n\beta^2b^2 - 2368r_0s_0n\beta^2b^4 - 3392r_0s_0nb\beta^2 - 8576r_0s_0nb^3\beta^2 - 4736r_0s_0nb^5\beta^2\\
& -6272(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^6 - 1600(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^8 - 3968(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^2 {-}^2\, b^4 + 864n\beta^2b^8\theta\\
& +192n\beta^2b^8\sigma + 960n\beta^2b^6\sigma - 138\beta^2\sigma - 2304s_mr_0^m\beta^3b^6 - 72r_{00}^2b^4 + 4968n\beta^2b^4\theta - 96r_{00}^2b^2 + 3r_{00}^2n\\
& -42r_{00|0}\beta + 10152s_0^2\beta^2 - 1312r_0^2\beta^2 - 992r_{0m}r_0^m\beta^2 - 288r_{0m}s_0^m\beta^2 - 1632s_{0|0}\beta^2 - 6656s_ms_0^m\beta^3\\
& -7632s_mr_0^m\beta^3 - 5088r_ms_0^m\beta^3 - 4800s_{0|m}^m\beta^3 + 168r_{00|0}\beta b^4 + 192r_{00|0}b^6\beta + 816r_{00}s_0\beta + 480r_{00}r_0\beta\\
& +42r_{00|0}n\beta - 48r_{00|0}\beta 7872(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^2 - 1704s_0^2n\beta^2 + 17600s_0^2\beta^2b^2 + 18016s_0^2\beta^2b^4 + 4672s_0^2b\beta^2\\
& -4608s_0^2b^3\beta^2 - 11904s_0^2b^5\beta^2 + 1312rr_{00}\beta^2 - 3136r_0^2b^2\beta^2 - 1600r_0^2b^4\beta^2 + 5248r_0^2b\beta^2 + 12544r_0^2b^3\beta^2\\
& +6400r_0^2b^5\beta^2 + 4032r_0s_0\beta^2 + 24r_{00}^2nb^2 + 36r_{00}^2nb^4 - 3936r_{0m}r_0^mb^2\beta^2 - 4704r_{0m}r_0^mb^4\beta^2\\
& -1600r_{0m}r_0^mb^6\beta^2 + 1440r_{0m}s_0^mb^2\beta^2 + 4032r_{0m}s_0^mb^4\beta^2 + 1728r_{0m}s_0^mb^6\beta^2 + 1232r_{0m}s_0^mn\beta^2\\
& -5184s_{0|0}b^2\beta^2 - 5040s_{0|0}b^4\beta^2 - 1536s_{0|0}b^6\beta^2 + 616s_{0|0}n\beta^2 + 4608rs_0\beta^3 + 3632s_ms_0^mn\beta^3\\
& -15552s_ms_0^m\beta^3b^2 - 10560s_ms_0^m\beta^3b^4 - 20736s_mr_0^m\beta^3b^2 - 14688s_mr_0^m\beta^3b^4 - 13824r_ms_0^m\beta^3b^2\\
& -3r_{00}^2 - 4176s_ms^m\beta^4 + 992r_{00}r_m^m\beta^2 + 992r_{00|m}b^m\beta^2 - 992r_{0m|0}b^m\beta^2 + 632s_ms_0^m\beta^2 + 5088s_0r_m^m\beta^3\\
& +5088s_{0|m}b^m\beta^3 - 2544s_{m|0}b^m\beta^3 - 20352s_{0|m}^mb^2\beta^3 - 27648s_{0|m}^mb^4\beta^3 - 13056s_{0|m}^m\beta^3b^6 - 3228s_m^is_i^m\beta^4\\
& +1792s_ms_0^m\beta^2b^6 - 768s_m^is_i^m\beta^4b^6 - 1368\beta^2b^4\sigma - 4968\beta^2b^4\theta - 1536s_{0|m}^m\beta^3b^8 + 512s_0^2b^8\beta^2\\
& +6784s_0^2\beta^2b^6 - 960\beta^2b^6\sigma + 138n\beta^2\sigma + 468n\beta^2\theta - 2592\beta^2b^2\theta - 744\beta^2b^2\sigma - 3744\beta^2b^6\theta\\
& -2560s_0^2\beta^2b^7 - 864\beta^2b^8\theta + 1536s_0r_m^m\beta^3b^6 + 1536s_{0|m}b^m\beta^3b^6 - 768s_{m|0}b^m\beta^3b^6 + 744n\beta^2b^2\sigma\\
& -1792s_ms_0^mb^6\beta^3 - 5472s_ms^mb^2\beta^4 - 5472s_m^is_i^m\beta^4b^4 - 1152s_ms^m\beta^4b^4 - 6016s_0^2nb^6\beta^2\\
& +1408s_ms_0^mn\beta^3b^6 + 3200r_0s_0b^6\beta^2 - 1536r_ms_0^m\beta^3b^6 - 512s_0^2nb^8\beta^2 - 9792r_ms_0^m\beta^3b^4
\end{aligned}
$$

$$
\begin{aligned}
A_{10} :=\ & -256s_ms_0^mb^8\beta + 128s_m^is_i^mb^8\beta^3 + 256s_ms^m\beta^3b^6 + 2176s_m^is_i^m\beta^3b^6 + 3264s_ms^m\beta^3b^4 - 64r_{00}s_0nb^2\\
& -112r_{00}s_0nb^4 + 64r_{00}s_0nb^3 + 64r_{00}s_0nb^5 + 16r_{00}s_0nb + 32r_{00}r_0nb^2 + 32r_{00}r_0nb^4 + 64r_{00}r_0nb^3\\
& +64r_{00}r_0nb^5 + 16r_{00}r_0nb + 1440s_0^2n\beta b^2 + 3904s_0^2n\beta b^4 + 4352s_0^2n\beta b^6 + 512s_0^2nb\beta + 1664s_0^2nb^3\beta\\
& +1280s_0^2nb^5\beta - 704rr_{00}b^2\beta - 512rr_{00}b^4\beta + 896rr_{00}b\beta + 2816rr_{00}b^3\beta + 2048rr_{00}b^5\beta + 256r_0s_0n\beta\\
& -3168r_0s_0\beta b^2 - 4992r_0s_0\beta b^4 - 1280r_0s_0\beta b^3 - 1472r_0s_0b\beta - 2560r_0s_0\beta b^6 + 1024r_0s_0\beta b^5\\
& -768r_{0m}s_0^mnb^2\beta - 1248r_{0m}s_0^mnb^4\beta - 640r_{0m}s_0^mnb^6\beta - 384s_{0|0}nb^2\beta - 624s_{0|0}nb^4\beta\\
& -320s_{0|0}nb^6\beta + 7424rs_0b\beta^2 + 15872rs_0b^3\beta^2 - 1664rs_0b^4\beta^2 + 6656rs_0b^5\beta^2 - 3744s_ms_0^mn\beta^2b^2\\
& -4320s_ms_0^mn\beta^2b^4 - 1344s_ms_0^mnb^6\beta^2 - 3968rs_0b^2\beta^2 - 672r_{00}r_m^mb^2\beta - 1056r_{00}r_m^mb^4\beta\\
& -512r_{00}r_m^mb^6\beta - 672r_{00|m}b^mb^2\beta - 1056r_{00|m}b^mb^4\beta - 512r_{00|m}b^mb^6\beta + 672r_{0m|0}b^mb^2\beta\\
& +1056r_{0m|0}b^mb^4\beta + 512r_{0m|0}b^mb^6\beta - 704s_ms_0^m\beta b^2 - 1536s_ms_0^m\beta b^4 - 1280s_ms_0^m\beta b^6 - 5568s_0r_m^mb^2\beta^2
\end{aligned}
$$

$$
\begin{aligned}
&-5952s_0r^m_m\beta^2b^4-1664s_0r^m_m\beta^2b^6-5568s_{0|m}b^mb^2\beta^2-5952s_{0|m}b^m\beta^2b^4-1664s_{0|m}b^m\beta^2b^6\\
&+2784s_{m|0}b^mb^2\beta^2+2976s_{m|0}b^m\beta^2b^4+832s_{m|0}b^m\beta^2b^6+6528s_ms^m\beta^3b^2+5824s^i_ms^m_i\beta^3b^2\\
&+6528s^i_ms^m_i\beta^3b^4+1112s^m_{0|m}\beta^2+80(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta+832r_0s_0n\beta b^2+640r_0s_0n\beta b^4+512r_0s_0nb\beta\\
&+1664r_0s_0nb^3\beta+1280r_0s_0nb^5\beta+1408(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^6+512(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^8+544(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^2\\
&+1344(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^4-68r_{00}s_0-32r_{00}r_0-24r_{00|0}b^4-2r_{00|0}n-32r_{00|0}b^6-2200s_0^2\beta+224r_0^2\beta\\
&+136r_{0m}r^m_0\beta+16r_{0m}s^m_0\beta+212s_{0|0}\beta+1760s_ms^m_0\beta^2+2256s_mr^m_0\beta^2+1504r_ms^m_0\beta^2\\
&+64r_{00}s_0b^4+112r_{00}s_0b^2-4r_{00}s_0n+320r_{00}s_0b^5+128r_{00}s_0b^3-16r_{00}s_0b-32r_{00}r_0b^4-80r_{00}r_0b^2\\
&+8r_{00}r_0n+320r_{00}r_0b^5+128r_{00}r_0b^3-16r_{00}r_0b-12r_{00|0}nb^2-24r_{00|0}nb^4-16r_{00|0}nb^6+296s_0^2n\beta\\
&-4928s_0^2\beta b^2-7680s_0^2\beta b^4+2048s_0^2\beta b^7+2816s_0^2\beta b^3-576s_0^2b\beta-5120s_0^2\beta b^6+6656s_0^2\beta b^5\\
&-224rr_{00}\beta+704r_0^2b^2\beta+512r_0^2b^4\beta-896r_0^2b\beta-2816r_0^2b^3\beta-2048r_0^2b^5\beta-800r_0s_0\beta+672r_{0m}r^m_0b^2\beta\\
&+1056r_{0m}r^m_0b^4\beta+512r_{0m}r^m_0b^6\beta-480r_{0m}s^m_0\beta b^2-1536r_{0m}s^m_0\beta b^4-1024r_{0m}s^m_0\beta b^6\\
&-152r_{0m}s^m_0n\beta+768s_{0|0}\beta b^2+816s_{0|0}\beta b^4+256s_{0|0}\beta b^6-76s_{0|0}n\beta-1856rs_0\beta^2-960s_ms^m_0n\beta^2\\
&+4896s_ms^m_0\beta^2b^2+4224s_ms^m_0\beta^2b^4+1216s_ms^m_0b^6\beta^2+8352s_mr^m_0b^2\beta^2+8928s_mr^m_0\beta^2b^4\\
&+2496s_mr^m_0\beta^2b^6+5568r_ms^m_0b^2\beta^2+5952r_ms^m_0\beta^2b^4+1664r_ms^m_0\beta^2b^6+57\beta\theta+18\beta\sigma+2r_{00|0}\\
&+2912s_ms^m\beta^3-136r_{00}r^m_m\beta-136r_{00|m}b^m\beta+136r_{0m|0}b^m\beta-112s_ms^m_0\beta-1504s_0r^m_m\beta^2\\
&-1504s_{0|m}b^m\beta^2+752s_{m|0}b^m\beta^2+6016s^m_{0|m}b^2\beta^2+11136s^m_{0|m}b^4\beta^2+7936s^m_{0|m}b^6\beta^2+1664s^m_{0|m}\beta^2b^8\\
&+1544s^i_ms^m_i\beta^3+1024s_0^2nb^8\beta-384n\beta b^2\theta-120n\beta b^2\sigma-936n\beta b^4\theta-288n\beta b^4\sigma-960n\beta b^6\theta\\
&-288n\beta b^6\sigma-336n\beta b^8\theta-96n\beta b^8\sigma-57n\beta\theta-18n\beta\sigma+384\beta b^2\theta+120\beta b^2\sigma+936\beta b^4\theta\\
&+288\beta b^4\sigma+960\beta b^6\theta+288\beta b^6\sigma+336\beta b^8\theta+96\beta b^8\sigma-1024s_0^2b^8\beta
\end{aligned}
$$

$$
\begin{aligned}
A_{11}:=&-4(\mathrm{Ric}-\overline{\mathrm{Ric}})+24nb^4\sigma+32nb^6\sigma+8nb^2\sigma+48nb^8\theta+16nb^8\sigma+96nb^6\theta+72nb^4\theta-64r_0s_0nb^2\\
&-64r_0s_0nb^4-128r_0s_0nb^3-128r_0s_0nb^5-32r_0s_0nb+1152rs_0\beta b^2+768rs_0\beta b^4-320s^i_ms^m_ib^8\beta^2\\
&-640s_ms^m\beta^2b^6-3072rs_0\beta b^5-4608rs_0\beta b^3-1536rs_0b\beta+672s_ms^m_0n\beta b^2+1056s_ms^m_0n\beta b^4\\
&+512s_ms^m_0n\beta b^6+1152s_0r^m_m\beta b^2+1728s_0r^m_m\beta b^4+768s_0r^m_m\beta b^6+1152s_{0|m}b^m\beta b^2+1728s_{0|m}b^m\beta b^4\\
&+768s_{0|m}b^m\beta b^6-576s_{m|0}b^m\beta b^2-864s_{m|0}b^m\beta b^4-384s_{m|0}b^m\beta b^6-3648s_ms^mb^2\beta^2-3264s_ms^m\beta^2b^4\\
&-2176s^i_ms^m_ib^2\beta^2-3648s^i_ms^m_i\beta^2b^4-2176s^i_ms^m_i\beta^2b^6-128(\mathrm{Ric}-\overline{\mathrm{Ric}})b^6-64(\mathrm{Ric}-\overline{\mathrm{Ric}})b^8\\
&-32(\mathrm{Ric}-\overline{\mathrm{Ric}})b^2-96(\mathrm{Ric}-\overline{\mathrm{Ric}})b^4+24nb^2\theta+512s_0^2b^2+1120s_0^2b^4-20s_0^2n+1152s_0^2b^6\\
&-384s_0^2b^3-1152s_0^2b^5-512s_0^2b^7+32s_0^2b+512s_0^2b^8-64r_0^2b^2-64r_0^2b^4+64r_0^2b+256r_0^2b^3+256r_0^2b^5\\
&+64r_0s_0-48r_{0m}r^m_0b^2-96r_{0m}r^m_0b^4-64r_{0m}r^m_0b^6+48r_{0m}s^m_0b^2+192r_{0m}s^m_0b^4+8s_ms^m_0\\
&+192r_{0m}s^m_0b^6+8r_{0m}s^m_0n-48s_{0|0}b^2-48s_{0|0}b^4+4s_{0|0}n-256s_ms^m_0\beta-360s_mr^m_0\beta-240r_ms^m_0\beta\\
&-144s^m_{0|m}\beta-3\theta-\sigma-8r_{0m}r^m_0-128s_0^2nb^2-496s_0^2nb^4-896s_0^2nb^6-128s_0^2nb^3-128s_0^2nb^5\\
&+64rr_{00}b^2+64rr_{00}b^4-64rr_{00}b-256rr_{00}b^3-256rr_{00}b^5+320r_0s_0b^2+704r_0s_0b^4-16r_0s_0n\\
&+96r_0s_0b+48r_{0m}s^m_0nb^2+96r_{0m}s^m_0nb^4+64r_{0m}s^m_0nb^6+24s_{0|0}nb^2+48s_{0|0}nb^4+32s_{0|0}nb^6\\
&+136s_ms^m_0n\beta-768s_ms^m_0\beta b^2-576s_ms^m_0\beta b^4-128s_ms^m_0\beta b^6-1728s_mr^m_0\beta b^2-2592s_mr^m_0\beta b^4\\
&-1152s_mr^m_0\beta b^6-1152r_ms^m_0\beta b^2-1728r_ms^m_0\beta b^4-768r_ms^m_0\beta b^6-1088s_ms^m\beta^2+48r_{00}r^m_mb^2\\
&+96r_{00}r^m_mb^4+64r_{00}r^m_mb^6+48r_{00|m}b^mb^2+96r_{00|m}b^mb^4+64r_{00|m}b^mb^6-48r_{0m|0}b^mb^2-96r_{0m|0}b^mb^4\\
&-64r_{0m|0}b^mb^6+192s_ms^m_0b^4+64s_ms^m_0b^2+256s_ms^m_0b^6+128s_ms^m_0b^8+240s_0r^m_m\beta+240s_{0|m}b^m\beta\\
&-120s_{m|0}b^m\beta-960s^m_{0|m}\beta b^2-8b^2\sigma-72b^4\theta-24b^4\sigma-96b^6\theta-32b^6\sigma-48b^8\theta-16b^8\sigma+16rr_{00}\\
&+8r_{00}r^m_m+8r_{00|m}b^m-8r_{0m|0}b^m+196s_0^2-16r_0^2-12s_{0|0}-2304s^m_{0|m}\beta b^4-2304s^m_{0|m}\beta b^6-768s^m_{0|m}\beta b^8\\
&-428s^i_ms^m_i\beta^2+3n\theta-24b^2\theta+n\sigma-32s_0^2nb-512s_0^2nb^8+640r_0s_0b^6-384r_0s_0b^5+384rs_0\beta,
\end{aligned}
$$

$$
\begin{aligned}
A_{12}:=\ &8(1+2b^2)^2(8s^i_ms^m_i\beta b^4+4s^m_{0|m}b^4-2s_ms^m_0b^2-4s_{0|m}b^mb^2+6s_mr^m_0b^2+16s_ms^m\beta b^2+4s^m_{0|m}b^2\\
&+4r_ms^m_0b^2+20s^i_ms^m_i\beta b^2-4s_0r^m_mb^2-2s_ms^m_0nb^2+2s_{m|0}b^mb^2+16rs_0b+3s_mr^m_0+2r_ms^m_0
\end{aligned}
$$

$$+s^m_{0|m} - 4rs_0 - 2s_0r^m_m - 2s_{0|m}b^m + 8s^i_m s^m_i\beta + 26s_m s^m\beta - s_m s^m_0 n + s_{m|0}b^m + 2s_m s^m_0),$$

$$A_{13} := -4(1+2b^2)^3(2s^i_m s^m_i b^2 + s^i_m s^m_i + 4s_m s^m).$$

12. Appendix 7: Coefficients in (16)

$$A'_0 := 24\beta^9(108(\mathrm{Ric} - \overline{\mathrm{Ric}})$$

$$\begin{aligned}
A'_2 := &-288\beta^9c^2(-11+8n) + 24\beta^7(-144c_0nb^2\beta + 192cs_0nb\beta - 384c^2b\beta^2 + 192c^2nb\beta - 96cs_0n\beta\\
&-342c_0n\beta + 192c_0\beta b^2 + 120cs_0\beta - 144c^2\beta^2 + 96c^2n\beta^2 - 384cs_0b\beta + 492c_0\beta) + 2\beta^5(3726\beta^2\theta\\
&-2592n\beta^2b^2\theta + 1728c_0b^2\beta^3 + 13068(\mathrm{Ric} - \overline{\mathrm{Ric}})\beta^2 + 2304cs_0nb\beta^3 + 15552(\mathrm{Ric} - \overline{\mathrm{Ric}})\beta^2b^2\\
&+3456(\mathrm{Ric} - \overline{\mathrm{Ric}})\beta^2b^4 + 324\beta^2\sigma + 144s_0^2\beta^2 + 576c^2\beta^4 + 9144s_{0|0}\beta^2 + 1296s^m_{0|m}\beta^3 - 6912s_0^2b\beta^2\\
&-2304c^2b\beta^4 + 288cs_0\beta^3 + 4032s_{0|0}b^2\beta^2 - 3672s_{0|0}n\beta^2 + 3888c_0\beta^3\\
&-324n\beta^2\sigma - 3726n\beta^2\theta + 2592\beta^2b^2\theta)
\end{aligned}$$

$$\begin{aligned}
A'_4 := &\,24\beta^7(1144c^2 + 928c^2b^2 + 64c^2b^4 - 865c^2n - 64c^2nb^4 - 712c^2nb^2) + \beta^3(-2304n\beta^2b^6\theta + 11061\beta^2\theta\\
&-1728n\beta^2b^4\sigma + 1216s_0^2n\beta^2b^2 - 512s_0^2n\beta^2b^4 + 28928s_0^2nb\beta^2 + 22016s_0^2nb^3\beta^2 + 2048s_0^2nb^5\beta^2\\
&+14464cs_0n\beta^3 - 1344cs_0\beta^3b^2 + 768cs_0\beta^3b^4 - 94016cs_0b\beta^3 - 60416cs_0b^3\beta^2 - 5120c\beta s_0b^5\beta^2\\
&-21696s_{0|0}nb^2\beta^3 - 8256s_{0|0}nb^4\beta^2 - 512s_{0|0}n\beta^2b^6 + 4608cb^2s_0b\beta^3 - 26352n\beta^2b^2\theta - 3456s_m s^m_0 n\beta^3b^2\\
&+24864c_0b^2\beta^3 + 8832c_0b^4\beta^3 + 512c_0b^6\beta^3 - 1728s_m s^m_0 b^2\beta^2 - 3456s_0cn\beta^3b^2 - 3456s_{0|m}b^m\beta^3b^2\\
&+1728s_{m|0}b^m\beta^3b^2 + 22976(\mathrm{Ric} - \overline{\mathrm{Ric}})\beta^2 + 11008cs_0n\beta^3b^2 + 1024cs_0n\beta^3b^4 + 28928cs_0nb\beta^3\\
&+22016cs_0nb^3\beta^3 + 2048cs_0nb^5\beta^3 + 11776(\mathrm{Ric} - \overline{\mathrm{Ric}})\beta^2b^6 + 512(\mathrm{Ric} - \overline{\mathrm{Ric}})\beta^2b^8\\
&+62752(\mathrm{Ric} - \overline{\mathrm{Ric}})\beta^2b^2 + 49728(\mathrm{Ric} - \overline{\mathrm{Ric}})\beta^2b^4 + 2214\beta^2\sigma - 16416n\beta^2b^4\theta - 20616s_0^2\beta^2\\
&+8288c^2\beta^4 + 31988s_{0|0}\beta^2 + 12672s_m s^m_0\beta^3 + 10368cs_0\beta^3 + 6912cs_0\beta^3 + 20520s^m_{0|m}\beta^3 + 5560s_0^2n\beta^2\\
&-2112s_0^2\beta^2b^2 + 768s_0^2\beta^2b^4 - 69568s_0^2b\beta^2 - 43264s_0^2b^3\beta^2 - 4096s_0^2b^5\beta^2 + 5888c^2b^2\beta^4\\
&+512c^2b^4\beta^4 - 33152c^2b\beta^4 - 23552c^2b^3\beta^4 - 2048c^2b^5\beta^4 - 8640cs_0\beta^3 + 48288s_{0|0}b^2\beta^2\\
&+17088s_{0|0}b^4\beta^2 + 1024s_{0|0}b^6\beta^2 - 12844s_{0|0}n\beta^2 - 1152cb^2s_0\beta^3 - 6480s_m s^m_0 n\beta^3 + 6336s_m s^m_0\beta^3b^2\\
&+5184cs_0\beta^3b^2 + 3456cs_0\beta^3b^2 + 15688c_0\beta^3 - 2160s_m s^m_0\beta^2 - 6912s_0cn\beta^3 - 6912s_{0|m}b^m\beta^3\\
&+3456s_{m|0}b^m\beta^3 + 27648s^m_{0|m}b^2\beta^3 + 6912s^m_{0|m}b^4\beta^3 + 648s^i_m s^m_i\beta^4 + 1728\beta^2b^4\sigma\\
&+16416\beta^2b^4\theta - 2214n\beta^2\sigma - 11061n\beta^2\theta + 26352\beta^2b^2\theta + 4320\beta^2b^2\sigma + 2304\beta^2b^6\theta - 4320n\beta^2b^2\sigma)\\
&+2\beta^5(-8896cs_0nb^2\beta - 1024cs_0n\beta b^4 + 18976cs_0nb\beta + 12544cs_0nb^3\beta + 1024cs_0n\beta b^5 + 6272c^2nb^2\beta^2\\
&+512c^2n\beta^2b^4 + 1024cs_0b^4\beta + 10432cs_0b^2\beta - 6568cs_0n\beta - 1024cs_0b^5\beta - 15616cs_0b^3\beta - 32608cs_0b\beta\\
&-512c^2b^4\beta^2 - 8192c^2b^2\beta^2 + 9488c^2n\beta^2 - 1024c^2b^5\beta^2 - 15616c^2b^3\beta^2 - 32608c^2b\beta^2 - 14232c_0nb^2\beta\\
&-4704c_0nb^4\beta - 256c_0nb^6\beta + 2304s_0^2nb\beta^2 + 2304c^2b^3\beta^2 + 1152cs_0n\beta^3 - 8064cs_0b\beta^3 - 1728s_{0|0}nb^2\beta^2\\
&-1728c^2nb^2\beta^2 - 1728c_m b^m b^2\beta^2 + 18976c^2nb\beta^2 + 12544c^2nb^3\beta^2 + 1024c^2n\beta^2b^5 + 12584c_0\beta\\
&+3888c^2\beta^2 + 4800c_0\beta b^4 + 256c_0b^6\beta + 640cs_0\beta - 16496c^2\beta^2 - 9698c_0n\beta + 15840c_0\beta b^2 - 576c^2b^2\beta^2\\
&+1728c^2b^2\beta^2 - 3888c^2n\beta^2 - 3888c_m b^m\beta^2 - 3888c^2n\beta^2 - 3888c_m b^m\beta^2)
\end{aligned}$$

$$\begin{aligned}
A'_6 := &\,2\beta(-3552n\beta^2b^6\theta + 1083\beta^2\theta - 1608n\beta^2b^4\sigma + 5360s_0^2n\beta^2b^2 + 5168s_0^2n\beta^2b^4 + 6016s_0^2nb\beta^2\\
&+11200s_0^2nb^3\beta^2 + 4096s_0^2nb^5\beta^2 + 3008cs_0n\beta^3 - 9840cs_0\beta^3b^2 - 5376cs_0\beta^3b^4 - 17920cs_0b\beta^3\\
&-22144cs_0b^3\beta^3 - 6016cs_0b^5\beta^3 - 4512s_{0|0}nb^2\beta^2 - 4200s_{0|0}nb^4\beta^2 - 1024s_{0|0}n\beta^2b^6 - 2560cb^4s_0\beta^3\\
&+12352cb^2s_0b\beta^3 + 10240cs_0\beta^3b^5 - 4776n\beta^2b^2\theta + 1024cs_0\beta^3b^7 - 256cs_0\beta^3b^6 + 64\beta^2b^8\sigma\\
&-7896s_m s^m_0 n\beta^3b^2 - 3552s_m s^m_0 n\beta^3b^4 + 6240c_0b^2\beta^3 + 5424c_0b^4\beta^3 + 1216c_0b^6\beta^3 - 2880s_m s^m_0 b^2\beta^2\\
&-2304s_m s^m_0 b^4\beta^2 - 9264s_0cn\beta^3b^2 - 3840s_0cn\beta^3b^4 - 9264s_{0|m}b^m\beta^3b^2 - 3840s_{0|m}b^m\beta^3b^4\\
&+4632s_{m|0}b^m\beta^3b^2 + 1920s_{m|0}b^m\beta^3b^4 + 3024s^i_m s^m_i\beta^4b^2 + 1756(\mathrm{Ric} - \overline{\mathrm{Ric}})\beta^2 + 5600cs_0n\beta^3b^2
\end{aligned}$$

$$
\begin{aligned}
&+2048cs_0n\beta^3b^4+6016cs_0nb\beta^3+11200cs_0nb^3\beta^3+4096cs_0nb^5\beta^3+7232(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^6\\
&+1216(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^8+8096(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^2+12480(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta^2b^4-480n\beta^2b^8\theta\\
&-64n\beta^2b^8\sigma-704n\beta^2b^6\sigma+292\beta^2\sigma+384cs_0\beta^3b^6-6876n\beta^2b^4\theta-12176s_0^2\beta^2+2080c^2\beta^4\\
&+3556s_{0|0}\beta^2+7368s_ms_0^m\beta^3+7500cs_0\beta^3+5000cs_0\beta^3+6316s^m_{0|m}\beta^3+2448s_0^2n\beta^2\\
&-14208s_0^2\beta^2b^2-8352s_0^2\beta^2b^4-10240s_0^2b\beta^2-5120s_0^2b^3\beta^2+2176s_0^2b^5\beta^2+3616c^2b^2\beta^4\\
&+1216c^2b^4\beta^4-8320c^2b\beta^4-14464c^2b^3\beta^4-4864c^2b^5\beta^4-5168cs_0\beta^3+9456s_{0|0}b^2\beta^2+7464s_{0|0}b^4\beta^2\\
&+1664s_{0|0}b^6\beta^2-1388s_{0|0}n\beta^2-3088cb^2s_0\beta^3-3956s_ms_0^mn\beta^3+12792s_ms_0^m\beta^3b^2+5376s_ms_0^m\beta^3b^4\\
&+13896cs_0\beta^3b^2+5760cs_0\beta^3b^4+9264cs_0\beta^3b^2+3840cs_0\beta^3b^4+1512s_ms^m\beta^4+2024c_0\beta^3\\
&-912s_ms_0^m\beta^2-5000s_0cn\beta^3-5000s_{0|m}b^m\beta^3+2500s_{m|0}b^m\beta^3+20000s^m_{0|m}b^2\beta^3+18528s^m_{0|m}b^4\beta^3\\
&++5120s^m_{0|m}\beta^3b^6+1944s^i_ms^m_i\beta^4-384s_ms_0^m\beta^2b^6+1608\beta^2b^4\sigma+6876\beta^2b^4\theta+256s^m_{0|m}\beta^3b^8\\
&-1408s_0^2\beta^2b^6+704\beta^2b^6\sigma-292n\beta^2\sigma-1083n\beta^2\theta+4776\beta^2b^2\theta+1220\beta^2b^2\sigma\\
&+3552\beta^2b^6\theta+512s_0^2\beta^2b^7+480\beta^2b^8\theta-256s_0cn\beta^3b^6-256s_{0|m}b^m\beta^3b^6+128s_{m|0}b^m\beta^3b^6\\
&-1220n\beta^2b^2\sigma+384s_ms_0^mb^6\beta^3+864s_ms^mb^2\beta^4+864s^i_ms^m_i\beta^4b^4+1280s_0^2nb^6\beta^2-256s_ms_0^mn\beta^3b^6\\
&-640cs_0b^6\beta^3+256cs_0\beta^3b^6)+\beta^3(-24672cs_0nb^2\beta-11712cs_0n\beta b^4+24336cs_0nb\beta+38016cs_0nb^3\beta\\
&+11520cs_0n\beta b^5+19008c^2nb^2\beta^2+5760c^2n\beta^2b^4+6912cs_0b^4\beta+21600cs_0b^2\beta-4980cs_0n\beta-768cs_0b^5\beta\\
&-20352cs_0b^3\beta-33744cs_0b\beta-5760c^2b^4\beta^2-28224c^2b^2\beta^2+12168c^2n\beta^2-768c^2b^5\beta^2-20352c^2b^3\beta^2\\
&-33744c^2b\beta^2-18252c_0nb^2\beta-14256c_0nb^4\beta-2880c_0nb^6\beta-5888c^2b^4\beta^2-512c^2b^6\beta^2+33152c^2b^3\beta^2\\
&++23552c^2b^5\beta^2+2048c^2b^7\beta^2-24864c^2nb^2\beta^2-8832c^2nb^4\beta^2-512c^2nb^6\beta^2-24864c_mb^mb^2\beta^2\\
&-8832c_mb^mb^4\beta^2-512c_mb^mb^6\beta^2+24336c^2nb\beta^2+38016c^2nb^3\beta^2+11520c^2n\beta^2b^5+7554c_0\beta\\
&+15688c^2\beta^2+8640c_0\beta b^4+1536c_0b^6\beta-18036cs_0\beta-26064c^2\beta^2-6570c_0n\beta+14832c_0\beta b^2\\
&-8288cb^2c\beta^2+24864c^2b^2\beta^2+8832c^2b^4\beta^2+512c^2b^6\beta^2-15688c^2n\beta^2-15688c_mb^m\beta^2)\\
&+2\beta^5(5280c^2b^4+25296c^2b^2-8049c^2n-17112c^2nb^2-5808c^2nb^4+11085c^2)
\end{aligned}
$$

$$
\begin{aligned}
A'_8:=\;&-256s_ms_0^mb^8\beta+128s^i_ms^m_ib^8\beta^3+256s_ms^m\beta^3b^6+2176s^i_ms^m_i\beta^3b^6+3264s_ms^m\beta^3b^4+1440s_0^2n\beta b^2\\
&+3904s_0^2n\beta b^4+4352s_0^2n\beta b^6+512s_0^2nb\beta+1664s_0^2nb^3\beta+1280s_0^2nb^5\beta+256cs_0n\beta^2-3168cs_0\beta^2b^2\\
&-4992cs_0\beta^2b^4-1280cs_0\beta^2b^3-1472cs_0b\beta^2-2560cs_0\beta^2b^6+1024cs_0\beta^2b^5-384s_{0|0}nb^2\beta\\
&-624s_{0|0}nb^4\beta-320s_{0|0}nb^6\beta+7424cb^3s_0\beta^2+15872cs_0b^5\beta^2-1664cb^6s_0\beta^2+6656cb^7s_0\beta^2\\
&-3744s_ms_0^mn\beta^2b^2-4320s_ms_0^mn\beta^2b^4-1344s_ms_0^mnb^6\beta^2-3968cs_0b^4\beta^2+672c_0b^2\beta^2\\
&+1056c_0b^4\beta^2+512c_0b^6\beta^2-704s_ms_0^m\beta b^2-1536s_ms_0^m\beta b^4-1280s_ms_0^m\beta b^6-5568s_0cnb^2\beta^2\\
&-5952s_0cn\beta^2b^4-1664s_0cn\beta^2b^6-5568s_{0|m}b^mb^2\beta^2-5952s_{0|m}b^m\beta^2b^4-1664s_{0|m}b^m\beta^2b^6\\
&+2784s_{m|0}b^mb^2\beta^2+2976s_{m|0}b^m\beta^2b^4+832s_{m|0}b^m\beta^2b^6+6528s_ms^m\beta^3b^2+5824s^i_ms^m_i\beta^3b^2\\
&+6528s^i_ms^m_i\beta^3b^4+1112s^m_{0|m}\beta^2+80(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta+832cs_0n\beta^2b^2+640cs_0n\beta^2b^4+512cs_0nb\beta^2\\
&+1664cs_0nb^3\beta^2+1280cs_0nb^5\beta^2+1408(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^6+512(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^8+544(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^2\\
&+1344(\mathrm{Ric}-\overline{\mathrm{Ric}})\beta b^4-2200s_0^2\beta+224c^2\beta^3+1760s_ms_0^m\beta^2+2256cs_0\beta^2+1504cs_0\beta^2+296s_0^2n\beta\\
&-4928s_0^2\beta b^2-7680s_0^2\beta b^4+2048s_0^2\beta b^7+2816s_0^2\beta b^3-576s_0^2b\beta-5120s_0^2\beta b^6+6656s_0^2\beta b^5+704c^2\beta^3b^2\\
&+512c^2\beta^3b^4-896c^2\beta^3b-2816c^2\beta^3b^3-2048c^2\beta^3b^5-800cs_0\beta^2+768s_{0|0}\beta b^2+816s_{0|0}\beta b^4\\
&+256s_{0|0}\beta b^6-76s_{0|0}n\beta-1856cb^2s_0\beta^2-960s_ms_0^mn\beta^2+4896s_ms_0^m\beta^2b^2+4224s_ms_0^m\beta^2b^4\\
&+1216s_ms_0^mb^6\beta^2+8352cs_0b^2\beta^2+8928cs_0\beta^2b^4+2496cs_0\beta^2b^6+5568cs_0b^2\beta^2+5952cs_0\beta^2b^4\\
&+1664cs_0\beta^2b^6+57\beta\theta+18\beta\sigma+2912s_ms^m\beta^3+136c_0\beta^2-112s_ms_0^m\beta-1504s_0cn\beta^2-1504s_{0|m}b^m\beta^2\\
&+752s_{m|0}b^m\beta^2+6016s^m_{0|m}b^2\beta^2+11136s^m_{0|m}b^4\beta^2+7936s^m_{0|m}b^6\beta^2+1664s^m_{0|m}\beta^2b^8\\
&+1544s^i_ms^m_i\beta^3+1024s_0^2nb^8\beta-384n\beta b^2\theta-120n\beta b^2\sigma-936n\beta b^4\theta-288n\beta b^4\sigma-960n\beta b^6\theta\\
&-288n\beta b^6\sigma-336n\beta b^8\theta-96n\beta b^8\sigma-57n\beta\theta-18n\beta\sigma+384\beta b^2\theta+120\beta b^2\sigma+936\beta b^4\theta\\
&+288\beta b^4\sigma+960\beta b^6\theta+288\beta b^6\sigma+336\beta b^8\theta+96\beta b^8\sigma-1024s_0^2b^8\beta+2\beta(-2064cs_0nb^2\beta
\end{aligned}
$$

$$
\begin{aligned}
&-2136cs_0n\beta b^4+1104cs_0nb\beta+2976cs_0nb^3\beta+1824cs_0n\beta b^5+1488c^2nb^2\beta^2+912c^2n\beta^2b^4\\
&+672cs_0b^4\beta+2040cs_0b^2\beta-156cs_0n\beta+2976cs_0b^5\beta+1536cs_0b^3\beta-1200cs_0b\beta-912c^2b^4\beta^2\\
&-2712c^2b^2\beta^2+552c^2n\beta^2+2976c^2b^5\beta^2+1536c^2b^3\beta^2-1200c^2b\beta^2-828c_0nb^2\beta-1116c_0nb^4\beta\\
&-456c_0nb^6\beta-3616c^2b^4\beta^2-1216c^2b^6\beta^2+8320c^2b^3\beta^2+14464c^2b^5\beta^2+4864c^2b^7\beta^2-6240c^2nb^2\beta^2\\
&-5424c^2nb^4\beta^2-1216c^2nb^6\beta^2-6240c_mb^mb^2\beta^2-5424c_mb^mb^4\beta^2-1216c_mb^mb^6\beta^2+1104c^2nb\beta^2\\
&+2976c^2nb^3\beta^2+1824c^2n\beta^2b^5+198c_0\beta+2024c^2\beta^2-36c_0\beta b^4-144c_0b^6\beta-2100cs_0\beta-1560c^2\beta^2\\
&-192c_0n\beta+360c_0\beta b^2-2080c^2b^2\beta^2+6240c^2b^2\beta^2+5424c^2b^4\beta^2+1216c^2b^6\beta^2-2024c^2n\beta^2\\
&-2024c_mb^m\beta^2)+\beta^3(6672c^2b^4+19272c^2b^2-2256c^2n-9240c^2nb^2-6504c^2nb^4+3504c^2)
\end{aligned}
$$

$$
\begin{aligned}
A'_{10}:=\;&8(1+2b^2)^2\big(8s^i_ms^m_i\beta b^4+4s^m_{0|m}b^4-2s_ms^m_0b^2-4s_{0|m}b^mb^2+6cs_0b^2+16s_ms^m\beta b^2+4s^m_{0|m}b^2\\
&+4cs_0b^2+20s^i_ms^m_i\beta b^2-4s_0cnb^2-2s_ms^m_0nb^2+2s_{m|0}b^mb^2+16cb^2s_0b+3cs_0+2cs_0+s^m_{0|m}-4cb^2s_0\\
&-2s_{0|m}b^m+8s^i_ms^m_i\beta+26s_ms^m\beta-s_ms^m_0n+s_{m|0}b^m+2s_ms^m_0)+2\beta(336c^2b^4+588c^2b^2-27c^2n\\
&-180c^2nb^2-216c^2nb^4+39c^2)-64cs_0nb^2-112cs_0nb^4+64cs_0nb^3+64cs_0nb^5+16cs_0nb+32c^2\beta nb^2\\
&+64c^2\beta nb^3+64c^2\beta nb^5+16c^2\beta nb-704cb^2cb^2\beta-512c^2b^2b^4\beta+896c^2b^3\beta+2816c^2b^5\beta+320cs_0b^5\\
&+2048c^2b^7\beta-672c^2nb^2\beta-1056c^2nb^4\beta-512c^2nb^6\beta-672c_mb^mb^2\beta-1056c_mb^mb^4\beta-512c_mb^mb^6\beta\\
&-68cs_0-32c^2\beta-24c_0b^4-2c_0n-32c_0b^6+136c^\beta+212s_{0|0}\beta+64cs_0b^4+112cs_0b^2-4cs_0n\\
&+128cs_0b^3-16cs_0b-32c^2\beta b^4-80c^2\beta b^2+8c^2\beta n+320c^2\beta b^5+128c^2\beta b^3-16c^2\beta b-12c_0nb^2\\
&-24c_0nb^4-16c_0nb^6-224c^2b^2\beta+672c^2b^2\beta+1056c^2b^4\beta+512c^2b^6\beta b^2\\
&+2c_0-136c^2n\beta-136c_mb^m\beta-2s_0cn+32c^2\beta nb^4\big).
\end{aligned}
$$

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