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Bicrossproduct Hopf quasigroups

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Abstract: We recall the notion of Hopf quasigroups introduced previously by the authors. We construct a bicrossproduct Hopf quasigroup $kM{\triangleright\!\!\blacktriangleleft}k(G)$ from every group X with a finite subgroup $G \subset X$ and IP quasigroup transversal $M \subset X$ subject to certain conditions. We identify the octonions quasigroup $G_{\mathbb{O}}$ as transversal in an order 128 group X with subgroup $\mathbb{Z}_2^3$ and hence obtain a Hopf quasigroup $kG_{\mathbb{O}}{\blacktriangleright\!\!\blacktriangleleft}k(\mathbb{Z}_2^3)$ as a particular case of our construction.

Keywords: IP loop, octonions, quantum group, quasiHopf algebra, monoidal category, finite group, coset
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