

Non-universality of string tension ratios and gluon confinement at finite temperature

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Abstract: We show that the Casimir scaling of string tensions observed in lattice simulations is naturally related to the smallness of the adjoint Polyakov loop in the confined phase. Particles in zero N -ality representations of $SU(N)$ can be used to modify simultaneously the adjoint Polyakov loop expectation value, string tension ratios, and mixing between representations of the same N -ality. This leads to a large class of effective Polyakov loop models, all confining at low temperatures. One limiting case is a Z_n spin model, while another is closely related to the deconfining transition in large- N models.