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Investigating SU(3) with $N_f=8$ fundamental fermions at strong renormalized coupling

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Tantalizing signs for a novel phase with symmetric mass generation have been reported for the SU(3) gauge system with $N_f = 8$ fundamental fermions (represented by two sets of staggered fields) at very large renormalized coupling (g_{GF}^2 *gtrsim25*). To scrutinize these findings, we are generating a set of large volume zero temperature ensembles using nHYP improved staggered fermions with additional Pauli-Villars fields to tame gauge field fluctuations. We consider the low-lying meson spectrum, the eigenmodes of the Dirac operator, as well as gradient flow measurements and attempt to understand their implications on the nature of SU(3) with $N_f = 8$ fundamental fermions.

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