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Sextet Model with Wilson Fermions

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We present new results from our ongoing study of the $SU(3)$ “sextet model” with two flavors in the 2-index symmetric representation of the gauge group. The simulations use unimproved Wilson fermions and to address the issue of whether or not the model is inside the conformal window, we measure the meson and baryon spectrum. To better understand the overall behavior of the lattice model we map out the bare parameter space, which reveals a non-trivial phase structure. At strong bare coupling, a first order phase transition is observed as a function of the bare mass, whereas closer to the continuum limit this first order transition disappears. Our study also shows that the behavior of mass spectrum (as a function of the quark mass) changes significantly when moving away from the bulk phase and into the weak coupling phase.

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