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The Nuclear and Chiral Transition in the Strong Coupling Regime of Lattice QCD

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Lattice QCD in the strong coupling limit with staggered quarks gives rise to a dual representation. Here, the sign problem is mild enough to study the phase diagram at finite density. In the strong coupling limit, the first order nuclear and chiral transition at low temperatures coincide due to Pauli saturation.

Away from the strong coupling limit, incorporating higher order gauge corrections, both transitions are expected to split, with an intermediate phase of nuclear matter where chiral symmetry is still broken.

We show numerical evidence from Monte Carlo simulations in the dual representation that indicate this splitting.

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