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First-order phase transition in dynamical 3-flavor QCD at imaginary isospin

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We revisit QCD with three mass-degenerate quark flavors at an imaginary isospin chemical potential set to 4pi/3. This choice corresponds to a special point in the parameter space, where the theory possesses an exact Z(3) center symmetry. Through a finite-size scaling analysis, we demonstrate that in this case the finite temperature QCD transition is of first order and entails singular behavior both in the Polyakov loop and in the quark condensate. Our results are based on simulations with stout-smeared staggered quarks and a dedicated multi-histogram analysis.

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