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## Dual condensates at finite isospin chemical potential

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The dual observables as order parameters for center symmetry are tested at finite isospin chemical potential  $\mu_I$  in a Polyakov-loop enhanced chiral model of QCD. As a counterpart of the dressed Polyakov-loop, the first Fourier moment of pion condensate is introduced for  $\mu_I > m_\pi/2$  under the temporal twisted boundary conditions for quarks. We confirm this dual condensate exhibits the similar temperature dependence as the conventional Polyakov-loop. We demonstrate that its rapid increase with  $T$  is driven by the evaporating of pion condensation. On the other hand, the dressed Polyakov-loop shows abnormal thermal behavior, which even decreases with  $T$  at low temperatures due to the influence of pion condensate. We thus argue that in QCD the critical temperature extracting from a dual observable may have nothing to do with the quark confinement-deconfinement transition if the quark mass is very small.

### On behalf of collaboration:

NONE

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