XXIV QUARK MATTER
DARMSTADT 2014

Contribution ID: **592** Type: **Poster**

Deconfinement phase transition with heavy quarks

Tuesday 20 May 2014 16:30 (2 hours)

We explore the influence of heavy quarks on the deconfinement phase transition in an effective model for gluons interacting with dynamical quarks in color SU(3). With decreasing quark mass, the strength of the explicit breaking of the Z(3) symmetry grows and the first-order transition ends in a critical end point (CEP). The nature of the critical endpoint is examined by studying the longitudinal and transverse fluctuations of the Polyakov loop, quantified by the corresponding susceptibilities. The longitudinal susceptibility is enhanced in the critical region, while the transverse susceptibility shows a monotonic behavior across the transition point. We also investigate the dependence of the CEP on the number of quark flavors at zero and finite quark density. Finally we confront our model results with lattice calculations and present a formula linking the hopping parameter to the quark mass.

On behalf of collaboration:

None

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Session Classification: Poster session

Track Classification: QCD Phase Diagram