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QCD phase diagram from DSEs

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We summarise recent theoretical results on the QCD phase diagram and the properties of QCD's critical point based on a combination of lattice QCD and Dyson-Schwinger equations.

Using lattice input for the quenched gluon propagator, our approach correctly reproduced and predicted $N_f=2+1$ flavour lattice results for the quark condensate and the unquenched electric and magnetic gluon propagator at zero chemical potential.

At chemical potential up to $\mu_B/T < 3$ our approach and extrapolations using lattice QCD both confirm an analytic crossover from the hadronic phase into the QGP. Beyond this region we see a critical end point at $(T^c, \mu_B^c) = (115, 504)$ MeV [1], which is neither very sensitive to additional charm quark contributions [1] nor to corrections from virtual baryons [2].

We are currently studying the zero temperature, high density region; first results will be presented and discussed.

[1] C.S.Fischer, J.Luecker and C.A.Welzbacher, *Phys. Rev. D* **90** (2014) no.3, 034022

[2] G.Eichmann, C.S.Fischer and C.A.Welzbacher, *Phys. Rev. D* **93** (2016) no.3, 034013

Primary author: Prof. FISCHER, Christian (JLU Giessen)

Presenter: Prof. FISCHER, Christian (JLU Giessen)

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