Contribution ID: **575** Type: **Oral Presentation**

Universality driven analytic structure of QCD crossover: radius of convergence and QCD critical point

Wednesday, 6 November 2019 16:40 (20 minutes)

Recent lattice QCD calculations show strong indications that the chiral crossover of QCD at zero baryon chemical potential (μ) is a remnant of the second order chiral phase transition. Furthermore, the non-universal parameters needed to map temperature T and μ to the universal properties of the second order chiral phase transition also have been determined by lattice QCD calculations. Motivated by these observations, first, we determine the analytic structure of the partition function - the so-called Lee-Yang edge singularity - in the QCD crossover regime, solely based on universal properties. Then, utilizing the lattice calculated non-universal parameters, we map this singularity to the real T and complex μ plane, and determine the closest singularity to μ=0 in the QCD crossover regime. These results lead to two important implications: (i) An universality based estimate of the radius of convergence for lattice QCD calculations at μ>0; (ii) Universality and lattice QCD based constraints on the location of the QCD critical point in the T-μ plane.

Primary authors: MUKHERJEE, Swagato (Brookhaven National Laboratory); SKOKOV, Vladimir (Brookhaven national laboratory)

Presenter: SKOKOV, Vladimir (Brookhaven national laboratory)

Session Classification: Parallel Session - QCD at finite temperature III

Track Classification: QCD at finite temperature and baryon density