



Contribution ID: 191

Type: Talk

## Charm thermodynamics near chiral crossover

*Tuesday, 30 July 2024 11:55 (20 minutes)*

I will talk about our recent results on the nature of charm degrees of freedom in hot strong interaction matter based on lattice QCD calculations of the second and fourth-order cumulants of charm fluctuations, and their correlations with net baryon number, electric charge, and strangeness fluctuations. I will begin by showing that below the chiral crossover temperature,  $T_{pc}$ , thermodynamics of charm can be very well understood in terms of charmed hadrons. Above  $T_{pc}$ , however, charm quark-like excitations emerge as new degrees of freedom contributing to the partial charm pressure. Nonetheless, up to temperatures as high as 175 MeV, charmed hadron-like excitations significantly contribute to the partial charm pressure. I will discuss the implications of these findings for understanding the nature of interactions inside the Quark-Gluon Plasma.

I will also discuss technical details related to the lattice QCD calculations of charm fluctuations. I will show that in open-charm physics, the major source of cutoff effects is the lightest charmed hadron mass, which in turn depends upon the input bare charm quark mass. I will discuss different approaches that we employed to take the continuum limit. These approaches were based on three different lines of constant physics used to tune the charm quark mass on the lattice.

**Primary author:** Dr SHARMA, Sipaz (Bielefeld University)

**Presenter:** Dr SHARMA, Sipaz (Bielefeld University)

**Session Classification:** QCD at non-zero temperature

**Track Classification:** QCD at Non-zero Temperature