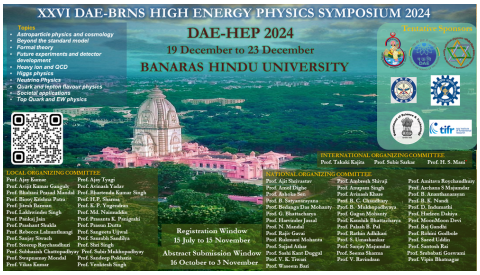

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Pionic properties in hot QCD from an effective field theory approach

Effective field theories (EFTs) can encapsulate quite successfully the physics of QCD; in presence of a realizable separation of scales. At very low and high temperatures respectively; theory of pions, and an effective weak coupling expansion describe the physics successfully. Because of the dependence on hierarchy of scales, these EFTs usually become unsuitable around cross over temperature. With global symmetries of the QCD as our guiding principle, we thus build an EFT of thermal QCD near cross-over temperature. Vector and axial symmetries help us to organize the theory. After treating this EFT in mean field theory, we are left with handful of low energy couplings. The pionic fluctuations around the mean field theory are then inspected up to one loop in fermions of the original EFT. The static correlators in the pionic theory become related to, the physical parameters of the same theory. The dependence of these physical parameters of the pionic theory, with the variation of temperature are predicted. The agreement of the results to the lattice data is encouraging.

Field of contribution

Phenomenology

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