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The curvature of the chiral pseudo-critical line from lattice QCD (15' + 5')

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The study of the temperature - baryon chemical potential $T - \mu_B$ phase diagram of strongly interacting matter is being performed both experimentally and by theoretical means. The comparison between the experimental chemical freeze-out line and the crossover line, corresponding to chiral symmetry restoration, is one of the main issues. In this talk I will present our recent determination of the curvature of the chiral pseudocritical line obtained by a lattice QCD computation. At present it is not possible to perform lattice simulations at real μ_B because of the sign problem. In order to circumvent this issue, we make use of analytic continuation from an imaginary chemical potential: this approach makes it possible to obtain reliable predictions for small real μ_B. By using a state-of-the-art discretization, we study the phase diagram of strongly interacting matter at the physical point for purely imaginary baryon chemical potential and zero strange quark chemical potential μ_s. We locate the pseudocritical line by computing two observables related to chiral symmetry, namely the chiral condensate and the chiral susceptibility. We then perform a continuum limit extrapolation with N_t =6,8,10 and 12 lattices, obtaining our final estimate for the curvature of the pseudocritical line $\kappa = 0.0135(20)$. Our study includes a thorough analysis of the systematics involved in the definition of $T_c(\mu_B)$, and of the effect of a nonzero μ_s.

Primary author: MESITI, Michele (University of Pisa and INFN - Sezione di Pisa, Italy)

Presenter: MESITI, Michele (University of Pisa and INFN - Sezione di Pisa, Italy)

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