

Exploring the QCD phase diagram in the region of highest μ_B with HADES

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The exploration of the QCD phase diagram in the region of high net-baryon density has gained strong interest in recent years. Among the reasons for that are the observation of multi-messenger signals emitted by binary neutron star mergers and the quest for the existence of a first order phase transition to a deconfined and/or chirally restored phase another one. HADES is a second-generation fix-target experiment with large acceptance and high rate capability operated at the SIS18 synchrotron of GSI, Germany, recently a part of the physics program of the FAIR project (FAIR Phase-0). It allows investigation of rare probes like dielectrons or multi-strange baryons (rare at these beam energies) as well as multi-differential investigations of bulk observables. In this contribution we will present recent results on flow observables, strangeness production, event-by-event proton multiplicity fluctuations and dilepton emission. The results will be confronted to model predictions with emphasis on signatures, which allow the characterization of medium properties of the matter formed in the collision. The data has been obtained in two heavy-ion experiments, Au+Au at 1.23 AGeV and Ag+Ag at 1.56 AGeV. Also included in the in the talk will be results from elementary reactions addressing the electromagnetic properties of hadrons, the precise understanding of which is an important requisite for the interpretation of thermal dilepton radiation.

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