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Flow phenomena at high nuclear densities with HADES

Monday, 18 September 2023 11:00 (30 minutes)

The study of strongly interacting matter under extreme conditions is one of the most important topics in the exploration of Quantum Chromodynamics (QCD).

In this talk, we present new measurements by the High Acceptance DiElectron Spectrometer (HADES) at GSI Helmholtzzentrum für Schwerionenforschung, relating to flow phenomena at high nuclear densities. HADES provides a large acceptance, combined with a high mass-resolution, and therefore allows to study dielectron, hadron and light nuclei production in heavy-ion collisions with unprecedented precision. HADES has accumulated data at highest statistics in Au+Au and Ag+Ag collisions at SIS18 energies.

We discuss recent results on light nuclei production and their collective phenomena. Moreover, flow coefficients v_n up to the 6th order are investigated for the first time in this energy regime. Their combined information allows to construct for the first time a full 3D-picture of the angular particle emission in momentum space. The multi-differential analysis in different centrality classes over a large region of phase space will be shown and various scaling properties will be discussed.

The data provide essential constraints for theoretical transport models utilised in the determination of the properties of dense baryonic matter, such as its viscosity and equation-of-state (EOS).

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