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# Flow phenomena at high nuclear densities with HADES

Heavy-ion collisions in the few-GeV energy range allow the creation of strongly interacting matter under extreme net-baryon densities, conditions which are comparable to the ones in neutron star mergers. The precise investigation of the Equation-of-State (EoS) of this kind of matter is therefore of high relevance for the understanding of neutron stars.

In this contribution, we present new measurements by HADES, the \textit{High-Acceptance Dielectron Spectrometer} located at the SIS18 at GSI in Darmstadt, which is currently the only experimental setup with the unique ability to measure rare and penetrating probes at the high-$\mu_B$ frontier of the QCD phase diagram.

We discuss recent high statistics results on collective flow phenomena of protons and light nuclei in Au+Au and Ag+Ag collisions at $\sqrt{s_{\mathrm{NN}}} = 2.42$ and $2.55$ GeV. In addition to the commonly discussed directed and elliptic flow, flow coefficients $v_n$ up to the 6\textsuperscript{th} 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 and can provide more stringent constraints on the \textit{Equation-of-State} (E0S). Furthermore, the event-by-event correlations between the different flow coefficients can be exploited for this purpose and will also be presented.

The multi-differential HADES flow data are confronted with various transport model approaches relevant for this energy region and current constraints e.g. derived via a Bayesian analysis on the EoS are discussed.

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