Anisotropic flow of strange hadrons in relativistic heavy ion collisions measured with HADES*

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The **H**igh **A**cceptance **D**i-**E**lectron **S**pectrometer (**HADES**) [1] installed at the SIS18 accelerator in GSI Darmstadt registers products of heavy ion collisions (as well as elementary interactions) at energies of a few GeV per nucleon. The nuclear matter produced in such collisions reaches extreme densities and temperatures [2, 3, 4], comparable to those expected in neutron stars, especially during their mergers [5]. By measuring the kinematic distributions of emitted particles and comparing them to transport model calculations – many aspects of the nuclear matter can be studied.

Particles containing the (anti)strange quark are of particular interest, as they are produced sparsely in this energy regime and act as good probes of their interaction with the medium. For charged K mesons it is predicted that due to their interaction in nuclear matter, their effective mass and decay constant should change [6]. This phenomenon was investigated by other experiments, but so far without a definitive conclusion [7]. Another interesting particle species is the Λ baryon, due to its predicted role in the so-called hyperon puzzle [8], where its interaction potential with nucleonic matter is an important piece of the "puzzle".

It is predicted that the anisotropic (transverse) flow – anisotropies in particle emission in the azimuthal angle (around the beam axis) – of strange hadrons should be sensitive to their interaction with the surrounding nuclear medium [7, 9]. As such, studying the transverse flow of these particles may bring a significant advantage in our understanding of hadronic matter in the studied energy range. Anisotropic flow is usually measured in the form of v_n coefficients corresponding to weights of subsequent Fourier harmonics of the distribution of the azimuthal angle with respect to the reaction plane. They are measured as maps in the momentum space represented with the relativistic variables of transverse momentum p_t and rapidity y.

This contribution will contain preliminary maps of $v_n(p_t, y)$ coefficients of anisotropic flow of strange hadrons – $K^{\pm}$ mesons and Λ baryons – emitted from Ag+Ag collisions at a beam energy of 1.58 GeV/nucleon. The work is in progress, however, the results may already provide insight into the kaon-nucleon interaction. The transverse flow of Λ baryons is the first such result in this energy regime.

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