

Collective flow measurements with HADES in Au+Au collisions at 1.23A GeV

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HADES has a large acceptance combined with a good mass-resolution and good particle-identification capability, and is well equipped to study the azimuthal flow pattern not only for protons and charged pions, but also for lambdas, kaons, ϕ -mesons and electrons-positron pairs, as well as deuterons, tritons and light nuclear fragments. With the statistics of seven billion Au-Au collisions at 1.23A GeV recorded in 2012, a multi-differential (p_t , rapidity, centrality) investigation with unprecedented precision is possible.

At the BEVALAC and SIS18 directed and elliptic flow has been measured for pions, charged kaons, protons, neutrons and fragments, but higher-order harmonics have not yet been studied. They provide additional information on the properties of the dense hadronic medium produced in heavy-ion collisions, such as its viscosity, and provide thus an important reference to measurements at higher energies. We present here a high-statistics, multi-differential measurement of radial flow, obtained with blast wave fit analysis, and of v_1 , v_2 and v_3 for protons in Au+Au collisions at 1.23A GeV.

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Author: KARDAN, Behruz (IKF, Goethe-Universität Frankfurt)

Presenter: KARDAN, Behruz (IKF, Goethe-Universität Frankfurt)

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