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An analytic hydrodynamical model of the effect of rotation on observables in heavy-ion collisions

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Observing the rotation of the expansion tells new information on the equation of state of the strongly interacting quark gluon plasma produced in high energy heavy ion collisions. In this work we review a recently found exact and analytic solution of fireball hydrodynamics. Its unique space-time picture (it describes an expanding, rotating three-axis ellipsoid) makes it a perfect candidate to analytically investigate the effect of rotation on the observables. THe calculation of single-particle spectra and two-particle correlation functions (and related quantites) will be presented, and argued that the experimentally measurable angle between the eigenframe of the single-particle spectrum and that of the HBT correlations is a quantitative signature of rotation. The observables are calculated using simple exact analytic formulas. In the spirit of the successful Buda-Lund model, we will also show the straightforward generalization of our analytic non-relativistic results to a relativistic parametrization, that predicts realistic momentum dependence of the parameters of the HBT correlations.

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