Abstract Submitted
for the DNP11 Meeting of
The American Physical Society

Energy dependence of the freeze out eccentricity from azimuthally-dependent HBT analyses at STAR CHRISTOPHER ANSON, Ohio State University, STAR COLLABORATION — Non-central heavy ion collisions at RHIC create an anisotropic participant zone of QCD matter under extreme conditions of energy and matter density. While this zone is initially out-of- plane-extended, pressure gradients cause the hot, dense medium to expand preferentially in plane. Over time, this expansion makes the shape more spherical, perhaps even becoming extended in the in-plane direction. The change in shape is determined by the expansion and freeze-out time scales which depend, in part, on the early pressure gradients. As a result, the freeze-out shape may provide a sensitive probe of the Equation of State of hot QCD matter. The recent RHIC Beam Energy Scan, which covered energies from $\sqrt{s_{NN}}$ of 7.7 to 39 GeV provides an opportunity to explore the energy dependence of the freeze out eccentricity. The new low energy data from STAR complements high statistics data sets at $\sqrt{s_{NN}}$ of 62.4 and 200 GeV. The dependence of the HBT radius parameters on azimuthal angle relative to the reaction plane have been extracted. These dependences can be related to the freeze out eccentricity within the context of a blast wave model. We will present STAR's most recent results from azimuthally-dependent HBT analyses across a wide range of energies.

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Date submitted: 01 Jul 2011 Electronic form version 1.4