Azimuthally sensitive HBT interferometry and the tilt of the pion source at AGS energies

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Abstract

In noncentral heavy-ion collisions, HBT correlations can be measured as a function of the azimuthal angle Φ of the pair momentum relative to the reaction plane. This yields a snapshot of the spatial shape and orientation of the particle source at freeze-out which complements the information on its shape and orientation in momentum space as extracted from anisotropic flow measurements. At AGS energies the largest Φ-dependent HBT signal results from the tilt of the major axis of the emission ellipsoid away from the beam direction. For pions this *spatial* tilt turns out to be directed *opposite* to the tilt of the directed flow ellipsoid. This provides valuable insight into the physical origin of pion directed flow. Possible applications of the method for RHIC will also be discussed.

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