Interpreting two-particle correlation and autocorrelation observables for proton-proton and Au-Au collision data from STAR LANNY RAY, The University of Texas at Austin, STAR COLLABORATION — Central collisions between Au ions at RHIC produce several thousand charged particles, about a thousand of which are detected with the large acceptance Time Projection Chamber of STAR. Two-particle correlations and autocorrelations are presented for the 130 GeV (per nucleon pair) data for charged particles for large ranges of relative transverse momentum (2 GeV/c), pseudorapidity (2 units), and azimuthal angle (180 deg) [1]. We obtain similar correlation observables for high energy proton-proton data (CM energy 200 GeV) taken with STAR. We argue that combined analyses of inclusive single-particle distributions and two-particle correlation data will provide deeper insight into the nature of the hot, dense medium produced at RHIC than can be achieved with analyses of singles data alone. We present the evolution of the correlation distributions for Au-Au as the collision centrality increases from very peripheral to the most central. The results of the analyses suggest the occurrence of semi-hard parton scattering, strong medium induced modification of the fragmentation pattern for the scattered partons, dissipation of the parton transverse momentum to the bulk medium, development of opacity, and an alteration of the way in which the longitudinally expanding medium hadronizes. [1] J. Adams et al., nucl-ex/0408012; nucl-ex/0411003; nucl-ex/0406035. Supported in part by The U.S. Dept. of Energy.

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