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## Two particle correlation measurements with respect to higher harmonic event planes at PHENIX

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Two particle correlations provide key information on the interactions between hard-scattered partons and the hot dense medium created by ultra-relativistic heavy ion collisions.

An important aspect of extracting jet functions from correlation measurements in heavy ion collisions is to estimate the underlying event background level and its modulation by  $v_n$ . This is essential for the goal of discerning possible medium response to hard-scattered partons. At both RHIC and the LHC, higher harmonic flow ( $v_n$ ) has recently been measured over a large rapidity range. Harmonics beyond  $v_2$  provide sensitivity to fluctuations of the initial collision geometry. After subtracting  $v_n$  component of the background, we are able to construct correlations in which the trigger particle is selected with respect to not only the second, but also higher, harmonic event planes. These provide detailed knowledge of the path length dependence of parton energy loss and its sensitivity to each harmonic event plane. This talk will present the current results of azimuthal hadron correlations both with and without trigger selection relative to higher harmonic event planes in Au+Au 200 GeV collisions.

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