

## Investigating correlations between jets and the QGP geometry via jet $v_n$

A measurement of the correlation between the axes of reconstructed jets and the reaction plane of the bulk medium (known as jet  $v_2$ ) and the higher-order participant planes (jet  $v_n$ ) provides information on the path-length dependence of medium-induced parton energy loss as well as biases in jet-finding methods. Additionally, knowledge of jet  $v_n$  and the ability to reconstruct the event plane in the presence of a jet are necessary in analyses of jet-particle correlations, which are used to study medium-induced jet shape modification.

A simple Monte Carlo Glauber model indicates that the average parton pathlength through the medium depends on the parton's relative angle to the  $n$ -th order participant planes, leading to a visible jet  $v_n$ . However, measurements of jet  $v_n$  are non-trivial because the presence of a jet can significantly bias the participant plane calculation, leading to an overestimation of jet  $v_n$ . A method is presented for calculating jet  $v_n$  and the event plane in an unbiased way, using knowledge of the azimuthal angle of the jet axis from full jet reconstruction.

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