

## Search for the elusive jet-induced diffusion wake in high-energy heavy-ion collisions

Diffusion wake is an unambiguous part of the jet-induced medium response in high-energy heavy ion collisions that leads to a depletion of soft hadrons in the opposite direction of the jet propagation. New experimental data on Z-hadron correlation in Pb+Pb collisions at the Large Hadron Collider show, however, an enhancement of soft hadrons in the direction of both the Z boson and the jet. Using the coupled linear Boltzmann transport hydro model, we demonstrate that medium modification of partons from the initial multiple parton interaction (MPI) gives rise to a soft hadron enhancement that is uniform in azimuthal angle while jet-induced medium response and soft gluon radiation contribute the most to the enhancement in the jet direction. After subtraction of the contributions from MPI with a mixed-event procedure, the diffusion wake becomes nearly visible in the near-side Z-hadron correlation. We further employ the gradient and jet tomography for the first time to localize the initial jet production positions in selected Z/ $\gamma$ -jet events in which the effect of the diffusion wake becomes more pronounced in Z/ $\gamma$ -hadron correlation, clearly visible even before the subtraction of MPI.

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