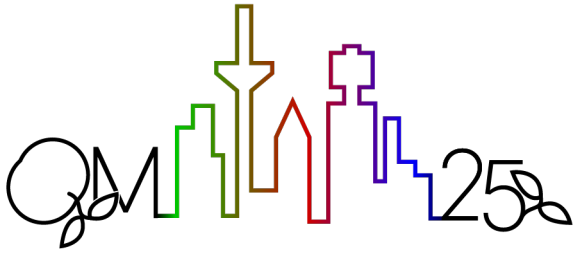

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First measurement of full event energy-energy correlation in high-Z tagged events in PbPb collisions in CMS

Wednesday 9 April 2025 09:40 (20 minutes)

The production of a Z boson provides a clean handle to control the population of events to be studied. By selecting muonic decays of Z bosons, we can isolate the effect of the recoiling process without potential bias from requiring isolation, as is the case for photons. Di-hadron correlations can naturally separate effects from different angular scales and enable jet substructure measurements without jet reconstruction bias. Similar to the energy-energy correlator (EE) in jets where perturbative and non-perturbative regimes are separated, by studying analogous correlation in the full event, one can unravel potential larger-scale structures that may arise from the interaction of high-energy recoiling particles with the quark-gluon plasma. This talk will present the first measurement of the energy-weighted di-hadron correlation with the CMS collaboration using events tagged with a Z boson. A significant modification of EEC is observed not only in small to intermediate angular scale but also extended to the phase space that is far away from the typical range covered by jet based EEC. The result provides new insight into the jet quenching mechanism and information about the inner workings of the QGP.

Category

Experiment

Collaboration (if applicable)

CMS

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