

## Fluctuations and local charge conservation

*Wednesday, May 29, 2024 12:00 PM (12 minutes)*

Transverse momentum correlations were recently measured by the ALICE collaboration at the LHC. A long-range structure in terms of relative pseudorapidity of particle pairs is observed. This may imply some signal of the initial state owing to the shear spread of the correlation. However, the fluctuations inside a thermally equilibrated medium have to be taken into account, serving as motivation for this letter. Using lattice Quantum Chromodynamics (lQCD) constraints, we predicted the development and spread of balancing correlations caused by energy-momentum conservation. Simultaneously, we propagated the initial correlation using hydrodynamics to estimate its effects. Our findings suggest that the resulting correlation, known as the ridge, is sensitive to both fluctuations in the equilibrated medium and the pre-equilibrium stage. This can provide important insight into the early stages of the collision.

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**Session Classification:** Session V

**Track Classification:** Physics of LHC experiments