

# Probing the shower properties of charm quarks using energy-energy correlators with ALICE

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$N$ -point energy correlators are currently attracting both theoretical and experimental interest, as they can be calculated to high order accuracy in perturbation theory and capture many different features contributing to the substructure of jets. The energy-energy correlator (EEC), or two-point correlator, which emphasise the angular structure of the energy flow within jets, allow for a comprehensive study of both the perturbative and non-perturbative aspects of jet structure. Defined as the energy-weighted cross-section of particle pairs inside jets, the EECs, as a function of pair distance, show a distinct separation of the perturbative from the non-perturbative regime, revealing parton-flavour-dependent dynamics of jet formation as well as the confinement of partons into hadrons.

In this talk, we report the first EEC measurement of a heavy-flavour jet, tagged via a fully-reconstructed  $D^0$  meson. Comparison to a measurement of EECs in inclusive jets offers valuable insight into flavour dynamics of QCD parton fragmentation and hadronisation, such as the different Casimir factors of quarks and gluons, as well as the mass of heavy quarks. Moreover, we will present comparisons with different Monte Carlo (MC) generators and theoretical predictions. This measurement will serve as a baseline for future studies in heavy ion collisions, probing the interplay of the dead cone and the interactions within the quark-gluon plasma.

## Collaboration

ALICE

## Category

Experiment

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