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Neutral Meson and EM Calorimeter Calibrations Methods from RHIC to EIC

EMCal-based photon and neutral meson measurements are key parts of both the physics and calibration methods at RHIC and the future EIC. With the advent of the Electron Ion Collider, which will involve many diverse calorimeter systems, and the switch to SiPM readouts which has been occurring over the past ~decade, new techniques in calorimeter calibrations are needed. These should address for example, gain tracing vs time, where siPM's can be more sensitive to temperature fluctuations, and also position dependencies in response, due to siPM light collection being less uniform than with traditional PMT's. We review EM calorimeter based meson measurements and several calibrations methods used for calibrating both hadronic and electromagnetic calorimeters at RHIC, LHC, and elsewhere, and also explore some possibilities for use at the upcoming EIC Facility. This includes several novel techniques developed for use at RHIC by our group. We will discuss calorimeter systems being planned for the ePIC experiment and specifically how the various methods, including ours, can be used there.

Category

Experiment

Collaboration (if applicable)

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