Optimization of the Cluster Finder of the STAR Forward Calorimeter System

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Abstract: The Forward Calorimeter System (FCS) is part of a newly installed upgrade to STAR experiment at RHIC (STAR) that is designed to expand measurements of quark and gluon spin dynamics in the proton at very high and low momentum fractions. The new sub-detectors consist of a sampling Electromagnetic Calorimeter (ECal) and a Hadronic Calorimeter (HCal) that will allow for full reconstruction of the energy and spatial distributions of electrons, hadrons and jets scattered at far forward pseudo-rapidities ($2.5 < \eta < 4$). Reconstruction of charged hadrons requires the optimization of a cluster finder that allows for cluster matching between calorimeters and the reconstructed tracks at forward rapidities with the other two new sub-detectors, a Silicon-strip tracker and small-strip Thin Gap Chambers. This presentation will discuss the tuning of the cluster-finding algorithm in the HCal and the performance for single and multi-particle simulated events.