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Characterization of Zero-Suppression in sPHENIX Calorimeters and its Impact on Topological Clusters DANIEL LIS, University of Colorado Boulder, SPHENIX COLLABORATION — The sPHENIX experiment at the Relativistic Heavy Ion Collider will begin data-taking in 2023. Decisions related to triggering, readout, and reconstruction can have a large effect on the ultimate experimental precision of the sPHENIX calorimeters. The reconstruction of 3-D topological clusters in the analysis of electromagnetic and hadronic particle showers associate energy deposits arising from the same particle and distinguish them from background noise. During data-taking, a complete readout of the 27,000 channels in the electromagnetic and hadronic calorimeters cannot be executed, so a zero-suppression scheme is necessary. We perform detailed GEANT4 studies of the calorimeter response to photons, hadrons, and jets under different simulated electronic noise scenarios and zero-suppression schemes. We study the impact of zero-suppression schemes on the topological cluster performance.

Daniel Lis
University of Colorado Boulder

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