An Event by Event Comparison of Clustering Algorithms

Author: Billy Pochron

Affiliation: Physics/STAR

In the effort of discerning the origin of the proton spin, the STAR detector at RHIC collide polarized protons at high energies and many particles are created. Of these, several particles are of interest, which include the neutral pion (π°) and the photon (γ). Within the endcap calorimeter (EEMC), there is a circular configuration of 720 tiles, composed of plastic scintillator strips called the shower max detector (SMD), pre- and post-shower detectors, and towers. This setup can detect photons and other charged particles. Two algorithms, dubbed "IU" and "TSP," have different methods of combining hits in the detectors to form clusters. If the clusters are photons, they could be reconstructed into π° particles. This study finds, qualitatively and quantitatively, the differences between the IU and TSP algorithms which will be used to determine which is best suited for the analysis of STAR data. Results are to be presented.

Information about the Author:
Billy is a senior physics major here at Valparaiso University. The root of his passion for physics stems from an inspirational high school physics teacher, and since his junior year of high school he knew he wanted to pursue physics. After graduation, Billy will be a second lieutenant in the Air Force and will earn his advanced degrees during his time of service.

Faculty Sponsor: Shirvel Stanislaus

Student Contact: billy.pochron@valpo.edu