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Study of a non-constant EMC Cut Parameter for Electron and Positron Tracks with Clusters in the Calorimeter of the PANDA Experiment

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Suranaree University of Technology is a member of the antiProton ANnihilation at DArmstadt (PANDA) collaboration. The goals of this collaboration are to understand the weak and strong nuclear force, exotic states of matter and the structure of hadrons by building a detector at the Facility for Antiproton and Ion Research (FAIR) in Darmstadt, Germany. At SUT, we are responsible for electromagnetic calorimeter (EMC) software development, in particular the tracking or charged particles. In this work, we study p_T dependent cut parameters to correlate tracks of electrons and positrons reconstructed from hits in the tracking system with clusters in the EMC. We find a bump in the EMC quality in the transverse momentum range of 0.8 - 2.0 GeV/c. Finally, we compare purity and completeness in a background event generator for the constant and non-constant cut and find that our new method yields a significant improvement.

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