Direct Photon and Neutral Pion Discrimination Using Machine Learning Technique at STAR

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Detection of direct photon and neutral pion coincidence with their recoil jet populations is important to study the QCD processes in proton-proton and heavy-ion collisions. Direct photon and neutral pion detection in STAR, with the Barrel Electromagnetic Calorimeter and the Barrel Shower Maximum Detector, result in different shower shapes. In this study, the TMultiLayerPerceptron class, a machine learning technique in the ROOT package, is utilized to discriminate direct photon and neutral pions samples using shower-shape quantities measured in STAR. The techniques and findings of the implementation of the TMultiLayerPerceptron class will be discussed in this study.