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A method of electromagnetic shower identification by using isolated bars with the DAMPE BGO calorimeter

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A method is proposed for electron/hadron discrimination for 3D imaging BGO calorimeter DAMPE (DARK Matter Particle Explorer) experiment. The technique uses isolated bars which are extracted by comparing to their nearby bars in the same layer. We find that the energy distribution and location of isolated bars are highly sensitive to the type of interaction of incident particle. Based on the Monte Carlo investigation of the characters of isolated bars, we demonstrate a particle identification algorithm that can efficiently distinguish electromagnetic shower and hadronic shower. The method is verified by using beam test data taken at CERN PS and SpS.

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Author: WANG, Chi (USTC)**Presenter:** WANG, Chi (USTC)**Session Classification:** Poster 1 DM and NU**Track Classification:** DM-IN