

Discrimination on electron/positron TB II beam identification analysis

In High Energy Physics it is essential the study of the particles that make up everything (at least the known baryonic universe). Carrying out a study of these particles is necessary devices (detectors). These devices interact with particles through known physical processes and then, through a data acquisition system, one can proceed for further analysis. In the MINER χ A experiment, the cross-section measurements are generally done. As a previous step, they used a mini test detector called Test Beam II (TB II) to see the response of new materials (objectives and scintillators) to different energy bands. In this work, the response of the Beam II test detector to electron and positron beams are studied. The response of this detector is studied for energies in the range of 2 to 8 GeV. A data/MC comparison is also performed to see discrepancies with the model used, as well as in the analysis of the behavior of electron and positron beams under different parameters (electromagnetic cascade opening angle, electromagnetic cascade starting module and energy absorbed by the calorimeter). Our method has allowed the differentiation of electron and positron beams, unequivocally for the energies in the range 2-6 GeV and, to a lesser extent, in the range 6-8 GeV. This is a genius result given that previous experiments did not obtain results that could differentiate well electron beams relative to positron beams in these beam energy ranges

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