ICRC2015

ICRC
The Astroparticle Physics Conference
34th International Cosmic Ray Conference
July 30 - August 6, 2015
The Hague, The Netherlands

Contribution ID: **481** Type: **Poster contribution**

Simulation studies of the expected proton rejection capabilities of CALET

Thursday 30 July 2015 15:30 (1 hour)

The CALorimetric Electron Telescope (CALET) is a Japanese led international space mission by JAXA (Japanese AeroSpace Agency) in collaboration with the Italian Space Agency (ASI) and NASA. The instrument will be launched to the International Space Station in 2015. The major scientific goals for CALET are to measure the flux of cosmic-ray electrons (including positrons) from 1 GeV to 20 TeV, gamma rays to 10 TeV and nuclei with Z=1 to 40 up to 1,000 TeV. These measurements are essential to search for dark matter signatures, investigate the mechanism of cosmic-ray acceleration and propagation in the Galaxy and discover possible astrophysical sources of high-energy electrons nearby the Earth.
The instrument consists of two layers of segmented plastic scintillators for the cosmic-ray charge identification, a 3 radiation length thick tungsten-scintillating fiber imaging calorimeter and a 27 radiation length thick lead-tungstate calorimeter. Protons are the largest source of background for the high-energy electron observation. As the ratio of protons to electrons increases at higher energies, a proton rejection power better than 10^5 is necessary to measure the electron spectrum with a proton contamination below a few percent in the TeV energy region.
In this work, a Monte Carlo based study of the proton rejection capability CALET can achieve from GeV to TeV energies is presented. Both standard analysis based on consecutive selection criteria and multivariate analysis are applied to simulated samples of signal and background events.
Finally, the resulting accuracy and signal-to-background ratio expected in the electron spectrum measurement are assessed.

Collaboration

CALET

Registration number following ”ICRC2015-I/”

208

Primary author: PALMA, Francesco (University of Rome Tor Vergata and INFN, Italy)

Co-author: SPARVOLI, Roberta

Presenter: SPARVOLI, Roberta

Session Classification: Poster 1 DM and NU

Track Classification: DM-IN