Contribution ID : **16** Type : **Oral**

PEBS - Positron Electron Balloon Spectrometer

Friday, 6 July 2007 10:54 (0:12)

Abstract content

The observation of a possible excess in the cosmic-ray positron spectrum has been suggested to originate from WIMP annihilations in the halo of the Galaxy. To measure this spectrum in the interesting energy range of 1-100 GeV with high precision, we are developing a dedicated balloon-borne spectrometer (PEBS).

The best measurement of the cosmic-ray positron flux available today was performed by the HEAT balloon experiment more than 10 years ago. Given the limitations in weight and power consumption for balloon experiments, a novel approach was needed to design a detector which could increase the existing data by more than a factor of 100. Using silicon photomultipliers for the readout of a scintillating fiber tracker and of an imaging electromagnetic calorimeter, the PEBS detector features a large geometrical acceptance of 4000 cmˆ2 sr, a total weight of 1500 kg and a power consumption of 900 W. The experiment is intended to measure cosmic ray particle spectra for a period of 20 days at an altitude of 40 km circulating the North or South Pole. A full Geant 4 simulation of the detector concept has been developed and key elements have been verified in a testbeam in October 2006 at CERN.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 2 (OG part 1), pages 293-296

Primary author(s) : Mr. GAST, Henning (I. Physikalisches Institut B, RWTH Aachen)

Co-author(s) : Mr. VON DOETINCHEM, Philip (I. Physikalisches Institut B, RWTH Aachen); Dr. KIRN, Thomas (I. Physikalisches Institut B, RWTH Aachen); Mr. ROPER YEARWOOD, Gregorio (I. Physikalisches Institut B, RWTH Aachen); Prof. SCHAEL, Stefan (I. Physikalisches Institut B, RWTH Aachen)

Presenter(s) : Mr. GAST, Henning (I. Physikalisches Institut B, RWTH Aachen)

Session Classification : OG 1.5

Track Classification : OG.1.5