



Contribution ID: 108

Type: Poster (Session A)

The AMS-02 Transition Radiation Detector

The Alpha Magnetic Spectrometer (AMS-02) experiment will be mounted on the International Space Station (ISS) for three years to perform precision cosmic particle spectroscopy in space. The search for dark matter candidates requires a precise e^+e^- spectroscopy in the energy range from 10 GeV up to 300 GeV. Therefore the dominating p -background has to be reduced by a factor 10^6 . This will be achieved with the AMS-02 electromagnetic calorimeter delivering 3-4 orders of magnitude and the transition radiation detector with proton rejections between 100 and 1000. The AMS-02 TRD consists of 20 layers of 6mm diameter straw modules alternating with 20 mm layers of polyethylene/polypropylene fleece radiator. The straws are filled with a 80%:20% Xe/CO₂ gas mixture at 1.0 bar absolute from a recirculating gas system designed to operate > 3 years. The straw modules will be operated in proportional mode at a gas gain of 3000. For the readout a dedicated low-power data-acquisition system based on VA analog multiplexers has been developed. The completed construction and assembly of the detector will be presented with special emphasis on space qualification, long flight duration aspects and calibration of the AMS-02 TRD. This project is funded by the German Space Agency DLR, the US Department of Energy DOE and NASA.

Author: KIRN, Thomas (RWTH Aachen)

Presenter: KIRN, Thomas (RWTH Aachen)