

12th Beam Telescopes and Test Beams Workshop



Contribution ID: 45

Type: Poster

Ions beam test of silicon micro-strip detectors for the AMS-02 upgrade

Wednesday, April 17, 2024 5:00 PM (5 minutes)

The Alpha Magnetic Spectrometer (AMS) is a space-borne experiment with the unique capability of distinguishing matter from anti-matter, thanks to its capability of measuring the charge sign from the track deflection within its magnetic field. The AMS Collaboration decided to upgrade the silicon tracker with the installation of an additional tracking layer on the top of the existing instrument. The work presented shows the results of a preliminary study on the performance of the new Silicon tracker layer, the Layer 0 (L0). Two silicon ladder prototypes have been exposed to a fragmented ions beam at the super-proton-synchrotron (SPS) of the CERN and to a Carbon beam at Centro Nazionale di Adroterapia Oncologica (CNAO) in Pavia, to characterize its charge resolution and the readout electronics. Moreover, different configurations of the setup have been tested to evaluate the effects of the meachanical structure that will enclose the complete Layer 0. A beam telescope composed of nine detectors, similar to the ones under test, have been used to characterize the beam upstream of the Device Under Test (DUT) and fragmentation in the downstream region. A high dynamic range, photodiodes based charge tagger detector was also used in combination with the beam telescope to identify the beam composition.

Primary authors: UBALDI, Alessio (Universita e INFN, Perugia (IT)); SILVESTRE, Gianluigi (INFN, Perugia (IT))

Co-authors: MIAO, Dexing (Institute of High Energy Physics, Beijing, China); PACINI, Lorenzo (INFN, Firenze (IT)); MOVILEANU, Maria (Universita e INFN, Perugia (IT)); DURANTI, Matteo (Universita e INFN, Perugia (IT)); BARBANERA, Mattia (Universita e INFN, Perugia (IT)); GRAZIANI, Maura (Universita e INFN, Perugia (IT)); FENG, Mingjie; MORI, Nicola (INFN Florence); STARODUBTSEV, Oleksandr (Universita e INFN, Firenze (IT)); LIU, Pingcheng; DETTI, Sebastiano (Universita e INFN, Firenze (IT)); SHENG, Shuqi; LI, Tiange; FORMATO, Valerio (INFN - Sezione di Roma Tor Vergata); JIANG, Xiaojie; JIANG, Yaozu (Universita e INFN, Perugia (IT)); XU, Zijun

Presenter: UBALDI, Alessio (Universita e INFN, Perugia (IT))

Session Classification: Poster session