



Contribution ID: 94

Type: **Poster presentation**

The prototype of Hi'Beam-SEE, a fast, high resolution particle position locating platform

Abstract

The single event effect (SEE) test precise positioning is a key technology that needs to be solved urgently in the world, and a lot of research has been carried out. For many radiation-resistant chips developed in China, it is necessary to improve the efficiency and accuracy of SEE research. Therefore, creating a chip SEE high-efficiency micron-level positioning device is very important. The device can precisely give the SEE sensitive area distribution of the chip. This paper has designed a non-interceptive and high-resolution beam position monitor device, named Hi'Beam-SEE, for Heavy Ion Research Facility at Lanzhou (HIRFL). The Hi'Beam-SEE consists of the detector system and the readout system. The novel Topmetal-M silicon pixel chip in the detector system directly collects negative ions generated by the heavy ions ionized air under the electric field. The readout system consists of a readout control module (RCM) and a Data Summary module (DSM). The RCM converts the analog signals from the detector into digital processes and sends them to the DSM via an optical fiber link. In the DSM, the position of the beam is calculated. We conducted tests on the Hi'Beam-SEE prototype to evaluate the performance. The test results show that the Hi'Beam-SEE has a good performance. This paper will discuss the design, characterization, and test of Hi'Beam-SEE.

Minioral

No

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No

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Yes

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Session Classification: Poster Session - B

Track Classification: Control, Monitoring, Test, Diagnostics Systems