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Design of a laser-based emittance meter for the H-beam at CSNS

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After the success of 80 MeV negative hydrogen beam profile measurement based on laser wire monitor, in order to further realize the beam emissivity measurement, an emissivity measurement system combining the laser wire monitor and LGAD (low-Gain Avalanche Diode) sensor is designed in this paper. The main idea is to use the LGAD sensor to reconstruct the H0 distribution, combined with the laser wire profile measurement, to realize the emissivity measurement of the negative hydrogen beam current. In this paper, we will focus on the design of the H0 distribution measurement system based on the LGAD sensor. It mainly includes the characterization of the LGAD sensor by the emissivity source; the evaluation of H0 particle energy deposition; the design of the ceramic PCB board of the LGAD sensor and the response test of the local signal.

Footnotes

Funding Agency

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Yes

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