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Development of a beam position monitor for MYRRHA high energy beams

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MYRRHA (Multi-Purpose Hybrid Research Reactor for High-Tech Applications) aims to demonstrate the feasibility of high-level nuclear waste transmutation at industrial scale. MYRRHA Facility aims to accelerate 4 mA proton beam up to 600 MeV. The accurate tuning of LINAC is essential for the operation of MYRRHA and requires measurement of the beam transverse position and shape, the phase of the beam with respect to the radiofrequency voltage with the help of Beam Position Monitor (BPM) system. MYRRHA is divided in two phases, the first phase, called MINERVA, includes several sections allowing beam acceleration up to 100 MeV. the second phase includes a High Energy Beam Transport (HEBT) line up to 600MeV. A BPM prototype was realized for the HEBT line. This paper addresses the design, realization, and calibration of this BPMs and its associated electronics. The characterization of the beam shape is performed by means of a test bench allowing a position mapping with a resolution of 0.02 mm.

Footnotes

Funding Agency

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Yes

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