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Design and development of an extraction septum for the MYRRHA 100 MeV proton target facility

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SCK CEN is developing MYRRHA, a large-scale Accelerator Driven System. MYRRHA shall be a subcritical nuclear reactor driven by a high-power linear proton accelerator, which sustains the nuclear reaction. In the initial phase, known as the MINERVA project, the goal is to demonstrate the high reliability requirements on the accelerator. The two primary end users of the MINERVA project are the Full Power Facility and the Proton Target Facility.
In collaboration with SCK CEN, CERN studied and designed an extraction septum for the 100 MeV Proton Target Facility. Two distinct topologies have been evaluated magnetically and tracked particle simulations have been executed to validate the designs. A preferred low-power solution has been retained for a subsequent detailed design. A final magnetic verification to confirm the mechanical design requirements has been carried out. This has allowed to develop a detailed 3D mechanical design including all manufacturing tolerances required for subcontracting the magnet fabrication to the industry.
This article covers the 2- and 3-dimensional magnetic modelling, the tracked particle simulations and the mechanical design of the septum magnet.

Footnotes

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Word

Region represented

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