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HIE-ISOLDE –General presentation of MATHILDE

In the frame of the HIE-ISOLDE project, most of the existing ISOLDE REX line will be replaced by a superconducting Linac in order to upgrade the energy and intensity of the REX ISOLDE facility at CERN. This upgrade involves the design, construction, installation and commissioning of 2 low- β and 4 high- β cryomodules. Each high- β -cryomodule houses five high- β superconducting cavities (6 for the low- β version) and one superconducting solenoid (2 for the low- β version).

Beam-physics simulations show that the optimum linac working conditions are obtained when the main axes of the active components, located inside the cryostats, are aligned and permanently monitored on the REX Nominal Beam Line (NBL) within a precision of 0.3 mm for the cavities and 0.15 mm for the solenoids at one sigma level along directions perpendicular to the beam axis.

The Monitoring and Alignment Tracking for HIE-ISOLDE (MATHILDE) system is based on opto-electronic sensors, precise optical elements, metrological tables and mechanical elements. Some of them will be exposed to non-standard environmental conditions such as high vacuum and cryogenic temperatures.

This paper summarizes the studies done for MATHILDE with special focuses on the viewport crossing, the software, the newly designed cameras (HBCAM) and the retro-reflective targets based on high index glass properties.

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