

HIE Isolde Alignment and Monitoring System – Technical Design and Project Status

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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. The linac will be based on the staged construction and installation of six cryomodules, four of them housing 5 high- β superconducting cavities and one superconducting solenoid, the two remaining ones containing 6 low- β superconducting cavities and two superconducting solenoids. Beam-physics simulations show that the optimum linac working conditions are obtained when the main axes of the active components, RF cavities and solenoid 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. This paper presents the proposed alignment and adjustment system based on opto-electronic sensors, optics, precise tables and adjustment mechanical elements which are used, for some of them, in non-standard environmental conditions such as high vacuum and cryogenic temperatures.

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