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SIG: a technology development program toward a compact Superconducting Ion Gantry

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Abstract
In the framework of a four-party agreement between INFN, CERN, CNAO, and MedAustron, the Superconducting Ion Gantry (SIG) project is the result of a call awarded by INFN-CSN V. The project scope is to explore new technological solutions for the critical elements of a 430 MeV/u carbon ion gantry including the superconducting dipole magnet system, the scanning magnet system, and new dose delivery and range verification systems. As for the dipole magnets, the project aims at proving the feasibility of winding and assembling a 4 T, cosθ superconducting accelerator magnet with a relatively small radius of curvature (1.65 m) through the design and construction of a demonstrator magnet. A parallel program at CERN is devoted to the construction of a straight thermal demonstrator to study new cooling strategies in absence of liquid helium. This contribution discusses the design activities carried out in the last year in the various project work packages (WPs) and reports on the present concepts and infrastructure for the first technological demonstrators.

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