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## Design and construction of the main magnet for a 230 MeV Superconducting Cyclotron

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For the applications of proton therapy and proton irradiation, and based on the R&D starting from 2009, a construction project of a 230 MeV superconducting cyclotron (CYCIAE-230) has been launched at China Institute of Atomic Energy (CIAE) since Jan 2015. A compact main magnet design with warm iron yokes and a superconducting coil system is adopted to reduce the size, and consequently to lower the construction and operation cost of the cyclotron. In this paper, the physics design, along with the mechanical design of the main magnet, including the structure of the main magnet and the screw lifting system of the main magnet, are described in detail; then the construction progress as well as the BH curve measurement results of the warm iron over the magnetic saturation region are outlined; the R&D of the superconducting coils system and the design of field mapping system are also briefly introduced.

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