

Superconducting magnet system of an in-flight fragment separator for a heavy ion accelerator planned in Korea

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Abstract: In-flight fragment separator system is a device to produce radioisotope beams and then to separate an isotope beam of interest using an array of magnetic and energy degrader system. The separator for a heavy ion accelerator planned in Korea consists of superferric quadrupole triplet and 30 degree dipole magnets to focus and bend the beam for momentum dispersion and achromatic focusing with use of mirror symmetric (or anti-symmetric) configurations. The superferric magnets will be operated in cryostat at 4 K. Tests of the coils in a LHedewar have been performed and the design of cryostat has been optimized. In addition, we plan to use a few superconducting magnets employing high-Tc superconductor (HTS) coils in the pre-separator area, where radiation heating on superconducting material is high. The HTS coils will be cooled by cold He gas in a temperature of 20-40 K to enhance the heat removal efficiency. Development of the HTS coils is ongoing in collaboration with a group of KERI. An HTS coil has been wound and tested at differing temperatures in a dewar using cryocooler. The progress on the system design and prototyping will be presented.