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Wed-Af-Po3.15-11 [15]: The Design of superconducting magnet for IF (In-flight Fragment) separator of RISP

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The RAON of Rare Isotope Science Project (RISP) in Korea will provide not only rare isotope (RI) beams, but also stable heavy ions, ranging from protons to Uranium. Both of the In-flight Fragment (IF) separation and the isotope separation on-line (ISOL) will be used in RAON. Six HTS quadrupole magnets and One HTS sextupole magnet will be installed in the forepart of IF separator considering high radiation environment near the IF production target. HTS quadrupole magnets have an aperture radius of 120 ~ 170 mm and field gradient of 2.9 ~ 10.5 T/m. In the other part of IF separator, thirteen LTS quadrupole triplet magnets will be installed. LTS quadrupole triplet magnet has the field gradient of 11 ~ 11.7 T/m and effective lengths of 550, 900 mm. The HTS prototype quadrupole magnet and the LTS prototype quadrupole triplet was fabricated and tested. Both of prototype magnets can be operated in the required field gradient stably, but they need some modifications such as yoke shape, coil specifications, etc. In this paper, the test results of prototype magnet are presented. Also, the modified designs based on test results are presented. All superconducting magnets for IF(In-flight Fragment) separator of RISP will be installed in 2021.

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