

<Abstract for RESMM'14>

RADIATION TRANSPORT CALCULATION FOR THE IN-FLIGHT FRAGMENT SEPARATOR OF RARE ISOTOPE SCIENCE PROJECT

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The In-flight fragment separator system of the rare isotope science project (RISP) is based on a high-power superconducting linear accelerator and composed of pre- and main separators. The production and selection of rare isotope beam of interest using high-power beam can induce large amount of radiation flux and heat in the separator components, especially in the area of the production target and beam dump of pre-separator.

Heat deposit on High Temperature Superconducting(HTS) magnets used in the area of the production target and beam dump to remove heat deposit more efficiently was evaluated. Shielding and collimator scheme was then investigated so as to reduce the heat deposit rate below the level of inducing magnet quench.

Radiation heating calculation was performed using PHITS. The calculated results of the peak heating value, absorbed dose rate, lifetime and total heat load of the HTS coils will be presented.