

Rare Isotope Accelerator Project in Korea and Its Application to High Energy Density Sciences

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As a national science project, the Korean government has recently established the Institute for Basic Science (IBS) with the goal of conducting world-class researches in medium-to-large scale basic sciences. One of the core facilities for the IBS will be the rare isotope accelerator which can produce high-intensity rare isotope beams to investigate fundamental properties of nature, and also to support a broad research program in the areas of material sciences, medical and biosciences, and future nuclear energy technologies. The construction of the accelerator is scheduled to be completed by around 2017. The design of the accelerator complex has been optimized to deliver high average beam currents on targets, and to maximize the production of rare isotope beams through the simultaneous use of Isotope Separation On-Line (ISOL) and In-Flight Fragmentation (IFF) methods. The proposed accelerator is, however, not indeed optimal for the high energy density sciences which usually require very high peak currents on the target. In this study, we present possible beam-plasma experiments that can be done within the scope of the current accelerator design, and also investigate possible future extension paths that may enable high energy density sciences with intense pulsed heavy ion beams.

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