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An In-flight Radioactive Beam Separator for the ATLAS Facility

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The Argonne In-flight Radioactive Ion Separator (AIRIS) is being proposed to enhance the radioactive beam capabilities of the ATLAS facility at ANL. In order to serve most of the experimental areas while maintaining stable beam operations, the separator consists of a magnetic chicane with a net zero-degree deflection. The chicane is made of four dipoles and four multipoles. In this design, all the beams are deflected to a middle plane away from the ATLAS beam line where a selection in magnetic rigidity is performed using slits. The selected radioactive beam is then deflected back to the ATLAS beam line. Stable beam operations are maintained by simply turning off the separator dipoles while using the quadrupoles for focusing. For contaminants not eliminated by magnetic separation, an rf sweeper will be used to take advantage of the time separation from the beam of interest. The design of the separator has recently been completed. We will describe the AIRIS design and its expected performance.

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