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## Gas stopping techniques with reacceleration

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Gas stopping of rare isotope beams together with reacceleration is unique at the Facility for Rare Isotope Beams (FRIB) at the Michigan State University. The stopping techniques, with beam manipulation at very low energies, are important developments aimed to slow down fast beams for either use in stopped beam experimental devices or to be injected in the reaccelerator for experiments at energies from 0.3 MeV/u to 12 MeV/u depending on the  $Q/A$  of the ion. We developed innovative stopped beam systems that were designed to optimize the stopping and extraction efficiencies for various atomic number ranges, as well as to reduce contamination and increase extraction speed. Moreover, reacceleration of those beams involve techniques of cooling, bunching, charge breeding and acceleration by a state-of-the-art superconducting LINAC (ReA). In this contribution I'll show the latest results of various gas stoppers and techniques to eliminate contaminants after reacceleration by the ReA. Typical efficiencies of each step will be presented as well as plans for future developments.

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