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The JENSA Gas Jet Target¹ K.A. CHIPPS, Univ of Tennessee, Knoxville/Oak Ridge National Laboratory, JENSA COLLABORATION — With the construction of next-generation radioactive ion beam (RIB) facilities, the study of many rare and unstable isotopes previously unattainable will be made possible. In order to take full advantage of possible measurements with these new isotope beams, improvements in detectors and targets are necessary. The Jet Experiments in Nuclear Structure and Astrophysics (JENSA) gas jet target is a new and cutting-edge target system, designed to provide a target of light gas, such as hydrogen or helium, that is localized, dense, and pure. In order to accomplish this, the JENSA system involves nearly two dozen vacuum pumps, differential pumping stages, a custom-built industrial compressor, and vacuum chambers designed to incorporate large arrays of both charged-particle and gamma-ray detectors. The JENSA gas jet target was originally constructed and characterized at ORNL, and has now moved to the ReA3 hall at the NSCL. Tests at ORNL show the JENSA system is capable of producing the most dense helium jet target for RIB studies in the world. JENSA will form the main target for the proposed SEparator for CAPture Reactions (SECAR), and together the two comprise the equipment necessary to facilitate the studies which form the focus of the U.S. experimental nuclear astrophysics community.

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