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Low-energy nuclear astrophysics studies at the Multicharged Ion Research Facility MICHAEL FEBBRARO, STEVEN PAIN, MARK BANNISTER, Oak Ridge National Laboratory, RICHARD DEBOER, University of Notre Dame, KELLY CHIPPS, CHARLES HAVENER, Oak Ridge National Laboratory, WILLAN PETERS, University of Tennessee, CHAD UMMEL, Rutgers Unversity, MICHAEL SMITH, Oak Ridge National Laboratory, ELI TEMANSON, University of Wisconsin, REBECCA TOOMEY, DAVID WALTER, Rutgers Unversity —
As low-energy nuclear astrophysics progresses toward measuring reaction cross sections in the stellar burning regimes, a worldwide effort is underway to continue these measurements at underground laboratories to achieve the requisite ultra-low-background environment. These facilities are crucial for providing the required low-background environments to perform such measurements of astrophysical importance. While advances have been made in the use of accelerators underground, of equal importance is the detectors, high-current targets, and techniques required to perform such measurements. With these goals in mind, a newly established astrophysics beamline has been built at the Multicharged Ion Research Facility (MIRF) located at Oak Ridge National Laboratory. The unique capabilities of MIRF will be demonstrated through two recent low-energy above-ground measurements of the dominant s-process neutron source ^{13}C(α,n)^{16}O and associated beam-induced background source ^{13}C(d,n)^{14}N. This material is based upon work supported by the U.S. DOE, Office of Science, Office of Nuclear Physics. Research sponsored by the LDRD Program of ORNL, managed by UT-Battelle, LLC, for the U.S. DOE.

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