Abstract Submitted
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First experimental determination of the ^{59}Fe$(n,\gamma_0)^{60}$Fe reaction via Coulomb dissociation E. UBERSEDER, University of Notre Dame, T. HEFTRICH, M. HEIL, J. MARGANIEC, R. REIFARTH, GSI Helmholtzzentrum fur Schwerionenforschung GmbH, 64291 Darmstadt, Germany, M. WIESCHER, University of Notre Dame, S389 COLLABORATION — The nucleosynthesis of ^{60}Fe is one of the current outstanding problems in nuclear astrophysics. Observations of galactic radioactivity by γ-ray telescopes have provided a direct measurement of the ^{60}Fe/^{26}Al^{g} ratio dispersed across the galactic plane. As the two isotopes are produced in similar stellar environments, the ratio provides a unique constraint on current stellar models. Specifically, ^{60}Fe is created and destroyed by neutron capture on stable iron isotopes. A recent measurement of the ^{60}Fe(n,γ)^{61}Fe reaction has provided a first experimental quantification of the destruction rate. Currently, no experimental data exist for the ^{59}Fe(n,γ)^{60}Fe production rate. To address this void, a Coulomb dissociation experiment has been performed at GSI to indirectly measure the ground state neutron capture cross section of ^{59}Fe. The ^{60}Fe beam was produced by fragmentation of a 660 AMeV primary ^{64}Ni beam by a Be target. The ^{60}Fe fragments were separated using the FRS and impinged on a lead target. The experimental setup provides for an event-by-event reconstruction of the four-momenta of all incoming particles and reaction products. The analysis is currently ongoing, and preliminary results will be discussed.

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