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Measurement of the ^{134}Te(d,p)^{135}Te Reaction in Inverse Kinematics STEVEN PAIN, Rutgers University, ORRUBA/RIBENS COLLABORATION — The development of high quality radioactive beams, such as those at the HRIBF at ORNL, has made possible the performance of transfer reactions on unstable nuclei. Measurements of (d,p) reactions on n-rich fission fragments yield data on nuclear structure away from stability, and are of astrophysical interest due to the proximity to suggested r- process paths. The energies and spectroscopic information of single-particle states near to shell closures are of particular importance, since they provide both an important constraint on nuclear structure models and are directly relevant to direct neutron-capture cross sections. The single-neutron states in ^{135}Te, one neutron beyond the N=82 shell closure, are of particular interest, both for r-process nucleosynthesis and its relevance to an isotopic anomaly of Xe found in pre-solar meteoritic grains. The ^{134}Te(d,p)^{135}Te reaction has been measured in inverse kinematics at the HRIBF utilizing a beam of ^{134}Te at 643 MeV and a deuterated plastic target. Proton ejectiles were detected forward and backwards of $\theta_{lab} = 90^{\circ}$ using an early implementation of the Oak Ridge Rutgers University Barrel Array (ORRUBA) in conjunction with SIDAR. Details of the experiment and the current stage of the data analysis will be presented.

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