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(d,n) Proton Transfer Reactions Relevant to Nuclear Astrophysics: The case of ^{17}O(d,n)^{18}F in Inverse Kinematics EDIZ ERSOY, Michigan State University / National Superconducting Cyclotron Laboratory — The (p,y) process plays an important role in stellar nucleosynthesis and the long term evolution of stars. The (p,y) direct capture process is difficult to observe experimentally due to the low energies and small reaction cross-sections involved, however by comparison, the (d,n)proton transfer process has higher reaction cross-sections in addition to providing insight into the (p,y) process through observations involving neutron kinematics. The particular (d,n) reaction investigated using inverse kinematics was the ^{17}O(d,n)^{18}F reaction. Neutron detection for the ^{17}O(d,n)^{18}F reaction is to be done utilizing the LENDA (Low Energy Neutron Detector Array) detectors. Several calculations were conducted to observe specific excitation levels of astrophysical interest between 5 and 7MeV. These calculations included correlations of neutron and ^{18}F kinetic energies with their center of mass and scattering angles at different excitation energies. The calculations further included detector placement and coverage for the observation of neutrons and ^{18}F isotopes. The time-of-flight and angular resolutions of the LENDA detectors were also studied in the calculations.

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