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$^{19}F(d,p)^{20}F$ measurements using the Super-Enge Split-Pole Spectrograph with implications to Type-I X-ray bursts[1] ALEX CONLEY, RAFFY TRAAS, SHELLY LESHER, UW, La Crosse, GORDON MCCAIN, KEN HANSELMAN, LAGY BABY, PAUL COTTLE, CHRIS ESPARZA, KIRBY KEMPER, FSU, ANTHONY KUCHERA, GRAY SELBY, Davidson, JESSICA NEBEL-CROSSON, LEW RILEY, Ursinus, INGO WIEDENHOEVER, FSU — Accreting neutron binary systems generate frequent x-ray bursts upon breaking out from the hot Carbon-Nitrogen-Oxygen (CNO) cycle to the rapid proton-capture process (rp) by the $^{15}O(\alpha,\gamma)^{19}Ne(p,\gamma)^{20}Na$ reaction chain. Previous studies investigated the $^{19}Ne(p,\gamma)^{20}Na$ reaction rate by using the $^{19}Ne(d,n)^{20}Na$ mirror reaction, relying on experimental data from the isospin-mirror reaction $^{19}F(d,p)^{20}F$ and shell model calculations to determine which states will populate with significant cross sections. We investigate the $^{19}F(d,p)^{20}F$ reaction as an indirect study of the $^{19}Ne(d,n)^{20}Na$ to obtain reliable data and lessen existing uncertainty of the thermal reaction rate. The experiment was performed using the Super-Enge Split-Pole Spectrograph at FSUs John D. Fox Accelerator Laboratory to measure high-resolution spectra of high-lying states in ^{20}F. Absolute cross sections and spectroscopic factors are determined for proton resonances in ^{20}F at 0.66, 2.04, 2.19, 2.97, 3.49, and 3.53 MeV energies which contribute to the level structure of ^{20}F.

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