Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

Study of proton-resonances in the ^{19}Ne(d,n)^{20}Na reaction using RESONEUT detector system[1] MEENU THAKUR, L.T. BABY, I. WIEDENHÖVER[1], E TEMANSON, K HANSELMAN, G MCCANN, J BLACKMON, Department of Physics, Florida State University, Tallahassee, Fl 32306, USA — Studies of nucleosynthesis in stellar explosions reveal that obtaining relevant information on the lowest lying resonances is crucial step to determine reaction rates in the astrophysical rp-process. In previous experiments at the RESOLUT facility, (d,n) reaction in inverse kinematics has been used to populate these resonances of astrophysical interest [1]. For such measurements, a compact neutron detector array RESONEUT has been developed which can efficiently detect low energy neutrons from (d,n) reaction [1]. In the present paper, results from our recently performed radioactive-beam experiment studying ^{19}Ne(d,n)^{20}Na reaction using RESONEUT will be presented. This reaction is comparable to direct proton capture ^{19}Ne(p,γ)^{20}Na, which is of astrophysical significance. Results from previous studies indicate the contradictions in spin and parity assignment of the first proton resonance in ^{20}Na. So, we study the population of the lowest lying proton resonances in ^{20}Na using neutron time of flight spectroscopy in an attempt to resolve these contradictions and determine accurate information of reaction rate. [1]S. Kuvin et al, PRC 96, 045812 (2017)

[1]This work is supported by the U.S. DOE under grant No. DE-FG02-02ER41220 and by the NSF under grant No. PHY-1712953

Meenu Thakur
Department of Physics, Florida State University, Tallahassee, USA

Date submitted: 02 Jul 2019 Electronic form version 1.4