Contribution ID: **71** Type: **Poster**

New investigations on the ^{32}S(^{3}He,d)^{33}Cl reaction at 9.6 MeV bombarding energy

The angular distribution of the differential cross section in (^{3}He,d) one-proton transfer reactions gives the possibility to probe the structure of nuclei by comparisons with shell model calculations, allowing to determine the spectroscopic factor for a variety of nuclei [1]. Indeed, the calculation of the spectroscopic factor it is in most cases the only way to estimate the strength of low energy resonances in (p,γ) reactions relevant for various hydrogen-burning scenarios in stellar evolution [2]. In this context, an interesting case study is the ^{32}S(^{3}He,d)^{33}Cl reaction for which contrasting results have been reported [3]. A new measure to determine the one-proton spectroscopic factor for the GS, 0.810, 2.356, 2.686 and 2.860 (doublet) MeV states in ^{33}Cl has been performed at the CN Van De Graaf accelerator of the Laboratori Nazionali di Legnaro. The new solid state telescope OSCAR [4], particularly suited for the identification and correlations of low energy particles, has been used to identify the emitted deuterons and to measure their energy. Good quality angular distribution in a broad angular range (20°-60°) has been achieved thanks to the segmentation of the OSCAR strip detector. Preliminary results of this new measure will be presented and compared both with theoretical calculations and data available in the literature.
[1] P. Hodgson, Nuclear Structure and Nuclear Reactions, Clarendon (1971)
[2] C. Iliadis et al, Astr. J. Suppl. Ser. 134 (2001) 151
[3] J. Chen and B. Sing, Nucl. Data Sheets 112 (2011) 1393
[4] D. Dell'Aquila et al., Nucl. Instrum. Meth. A 877 (2018) 227

Primary authors: CINAUSERO, Marco (LNL); VIGILANTE, Mariano (NA); LOMBARDO, Ivano (CT); D'ANDREA, Maurizio (CT); DELL'AQUILA, Daniele (NSCL, Michigan State University, East Lansing, USA); GRAMEGNA, Fabiana (LNL); MARCHI, Tommaso (INFN - LNL); CARTURAN, Sara Maria (LNL); CICERCHIA, Magda (LNL); MANTOVANI, Giorgia (LNL); FABRIS, Daniela (PD); SCOMPARIN, Luca (L); BOLZONELLA, Riccardo (Università di Padova e INFN Sezione di Padova); BRUNO, Mauro (BO); CASINI, Giovanni (FI); BUCCOLA, Antonio Maria (FI); VALDRE', Simone (FI); PIANTELLI, Silvia (FI); PASQUALI, Gabriele (FI); BARLINI, Sandro (FI); OTTANELLI, Pietro (FI); FROSIN, Catalin (FI); Dr DEGERLIER, Meltem (N. H. Bektas Veli University, Nevsehir, Turkey); KORDYASZ, A. (Heavy Ion Laboratory, University of Warsaw, Poland); KOZIK, Tomasz (Jagiellonian University, Institute of Physics, Krakow, Poland); LÉPINE-SZILY, Alinka (Universidade de Sao Paulo); ROMERO GASQUES, Leandro (N)

Presenter: CINAUSERO, Marco (LNL)

Session Classification: POSTER SESSION