



Contribution ID: 98

Type: not specified

## Measurement of the $^{12}\text{C}(p,\gamma)^{13}\text{N}$ S-factor in inverse kinematics

Thursday, 6 September 2018 15:55 (18 minutes)

The  $^{12}\text{C}(p,\gamma)^{13}\text{N}$  reaction is relevant in several astrophysical scenarios, such as the early stages of the Bethe-Weizsäcker cycle of hydrogen burning and the production of  $^{13}\text{C}$  in stars on the asymptotic giant branch of the Hertzsprung-Russell diagram. Here new data on the  $^{12}\text{C}(p,\gamma)^{13}\text{N}$  astrophysical S-factor at low energy, 0.1-0.5 MeV in the center of mass system are reported from an experiment in inverse kinematics. Titanium hydride targets were irradiated with an intensive  $^{12}\text{C}$  ion beam from the HZDR 3 MV Tandatron accelerator. The emitted  $\gamma$ -rays were detected in a lead shielded high-purity germanium detector also equipped with a cosmic ray veto. For target characterization, Nuclear Resonant Reaction Analysis (NRRA) was used with a 6.4 MeV  $^{15}\text{N}$  beam. The new data will contribute to the understanding of the creation of chemical elements in the precursors of core-collapse supernovae.

### Selected session

Nuclear Astrophysics

**Primary author:** REINICKE, Stefan (Helmholtz-Zentrum Dresden-Rossendorf, Technische Universität Dresden)

**Co-authors:** Dr BEMMERER, Daniel (Helmholtz-Zentrum Dresden-Rossendorf); LUDWIG, Felix (Helmholtz-Zentrum Dresden-Rossendorf, Technische Universität Dresden); Prof. ZUBER, Kai (Technische Universität Dresden); STÖCKEL, Klaus (Helmholtz-Zentrum Dresden-Rossendorf, Technische Universität Dresden); WAGNER, Louis (Helmholtz-Zentrum Dresden-Rossendorf, Technische Universität Dresden); GRIEGER, Marcel (Helmholtz-Zentrum Dresden-Rossendorf, Technische Universität Dresden); Dr TAKACS, Marcell (Helmholtz-Zentrum Dresden-Rossendorf, Technische Universität Dresden); Dr SCHWENGER, Ronald (Helmholtz-Zentrum Dresden-Rossendorf); Dr AKHMADALIEV, Shavkat (Helmholtz-Zentrum Dresden-Rossendorf); SCHULZ, Stefan (Helmholtz-Zentrum Dresden-Rossendorf, Technische Universität Dresden)

**Presenter:** REINICKE, Stefan (Helmholtz-Zentrum Dresden-Rossendorf, Technische Universität Dresden)

**Session Classification:** Nuclear Astrophysics