Contribution ID: **299** Type: **Oral Presentation**

The study of the 21Ne(p,γ)22Na reaction at LUNA and its astrophysical impact

The production and abundances of neon and sodium isotopes in massive stars, novae and supernovae is strictly connected to the cross section of proton reactions with Ne isotopes. In particular, the 21Ne(p,γ)22Na reaction has a relevant role in the production of the radioactive isotope 22Na in novae and supernovae. At T~0.1-0.7GK, the main contributions to the stellar rate are provided by several resonances (Ep=126, 271, 272, 290 and 352 keV). The reaction has been recently studied at LUNA (Laboratory for Underground Nuclear Astrophysics) using the intense proton beam delivered by the LUNA 400 kV accelerator and a windowless differential-pumping gas target coupled with two high-purity germanium detectors. The resonance strengths and branching ratios have been determined for all the resonances of interest and in the case the strength of the 272.3 keV resonance a > 3σ tension with an earlier measurement was found. Several new transitions have also been observed for 22Na excited states. The contribution is aimed to summarize the new results and to highlight their impact on 1.05-1.25 M/M novae scenarios.

Authors: CACIOLLI, Antonio (University and INFN Padova); MASHA, Eliana; Dr CAVANNA, Francesca (INFN Turin); Dr ZAVATARELLI, Sandra (INFN Genova)

Presenter: CACIOLLI, Antonio (University and INFN Padova)

Session Classification: Parallel session

Track Classification: Nuclear Astrophysics