



Contribution ID: 569

Type: **Contributed Oral Presentation**

Preliminary study of the $^{19}\text{F}(p,\gamma)^{20}\text{Ne}$ at LUNA

Thursday, 29 May 2025 11:25 (15 minutes)

The $^{19}\text{F}(p,\gamma)^{20}\text{Ne}$ reaction plays a pivotal role in nucleosynthesis, particularly in the breakout from the CNO cycle to heavier elements. Its contribution is critical to understanding the elemental evolution of first-generation stars and the production of observed calcium abundances in metal-poor stars, but it is still not well constrained as demonstrated in the recent studies.

The LUNA (Laboratory for Underground Nuclear Astrophysics) facility, located deep underground to minimize cosmic-ray-induced background, is uniquely suited for precise low-energy nuclear astrophysics studies, as demonstrated in the past. As part of a dedicated effort to study the $^{19}\text{F}(p,\gamma)^{20}\text{Ne}$ reaction, initial irradiations were recently performed to evaluate and characterize three different types of targets. Each target type demonstrated distinct and complementary properties, allowing us to refine our approach for subsequent measurements.

Preliminary results that will be presented include target stability assessments and early observations of the two resonances of astrophysical interest. These findings lay the groundwork for further precise investigations into this reaction, more importantly in the region where the direct capture dominates, and give a first comparison with the novel findings of the JUNA collaboration.

Primary author: SKOWRONSKI, Jakub (Università degli Studi di Padova)

Presenter: SKOWRONSKI, Jakub (Università degli Studi di Padova)

Session Classification: Parallel Session

Track Classification: Nuclear Astrophysics