



Contribution ID: 64

Type: Poster

## A new measurement of the ${}^6\text{Li}(p,\gamma){}^7\text{Be}$ cross section at LUNA

*Tuesday, 20 June 2017 19:30 (2 hours)*

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%
% Nuclear Physics in Astrophysics 8 template for abstract
%
% Format: LaTeX2e.
%
% Rename this file to name.tex, where 'name' is the family name
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%
\documentstyle[11pt]{article}
%
% PAGE LAYOUT:
%
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\voffset -0.85in
\hoffset -0.35in
\topmargin 0.305in
\oddsidemargin +0.35in
\evensidemargin -0.35in

%\renewcommand{\rmdefault}{ptm} % to use Times font

\long\def\TITLE#1{\Large\bf#1}\long\def\AUTHORS#1{ #1\}[3mm]}
\long\def\AFFILIATION#1#2{^1 #2\}
\begin{document}
\small \it Nuclear Physics in Astrophysics 8, NPA8: 18-23 June 2017, Catania, Italy}

\vspace{12pt}

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\begin{center}
%%
%% Title goes here.
%%
\TITLE{A new measurement of the  ${}^6\text{Li}(p,\gamma){}^7\text{Be}$  cross section at LUNA}\[3mm]
%%
%% Authors and affiliations are next. The presenter should be
%% underlined as shown below.
%%
\AUTHORS{\uR. Depalo1,2 for the LUNA collaboration }

%%
\small \it
\AFFILIATION{1}{Dipartimento di Fisica e Astronomia, Universit\`a degli Studi di Padova, Padova, Italy}
\AFFILIATION{2}{INFN - Sezione di Padova, Padova, Italy}
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}
%%
\vspace{12pt} % Do not modify

% Enter contact e-mail address here.

\centerline{Contact email: {\it rdepalo@pd.infn.it}}

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\end{center}
%%
%% Abstract proper starts here.
%%
The detection of  ${}^6\text{Li}$  in stars is a powerful tool for understanding the Big Bang nucleosynthesis, as well as the
early stellar structure and evolution.\\
In stars, lithium is quickly destroyed during the pre-main sequence and main sequence phases, at temperatures
of about 2 MK. Theoretical predictions of lithium abundances in the stellar surface are strongly dependent on
the input physics and in many cases non-standard processes are required to explain the observed abundances
[1].\\
The  ${}^6\text{Li}$  depletion proceeds mainly through the  ${}^6\text{Li}(p,\alpha){}^3\text{He}$  reaction. This reaction has been studied by many
groups, and in order to explain the angular distribution of the emitted alpha particles, an R-matrix fit of the
experimental data requires the contribution of both negative and positive parity excited states [2]. \\
Although the existence of positive parity excited states in  ${}^7\text{Be}$  has never been confirmed experimentally,
a recent measurement of the  ${}^6\text{Li}(p,\gamma){}^7\text{Be}$  cross section revealed a possible resonance-like structure at center
of mass energy of 195 keV [3]. The observed S-factor is reproduced by an R-matrix fit assuming the existence
of an excited state with  $E \approx 5800$  keV and  $J^\pi = (1/2^+, 3/2^+)$ .\\
A new measurement of the  ${}^6\text{Li}(p,\gamma){}^7\text{Be}$  cross section at proton energies between 50 and 400 keV has been
performed at the Laboratory for Underground Nuclear Astrophysics. The poster provides a description of the
experimental setup and preliminary results of the data analysis.

\bigskip
\small

\noindent [1] E. Tognelli et al. A\&A \textbf{548}, A41 (2012)\\
\noindent [2] J. Cruz et al. J. Phys. G Nucl. Part. Phys. \textbf{35}, 014004 (2008)\\
\noindent [3] J. J. He et al. Phys. Lett. B \textbf{725}, 287-291 (2013)\\
%%
%% End of abstract.
%%
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**Presenter:** DEPALO, Rosanna (P)

**Session Classification:** Poster session

**Track Classification:** Stellar evolution and nucleosynthesis