



Contribution ID: 19

Type: Oral

Direct cross section measurement for the O-18(p,gamma)F-19 reaction at LUNA

Monday, 19 June 2017 18:10 (20 minutes)

```
%
% Nuclear Physics in Astrophysics 8 template for abstract
%
% Format: LaTeX2e.
%
% Rename this file to name.tex, where 'name' is the family name
% of the first author, and edit it to produce your abstract.
%
\documentstyle[11pt]{article}
%
% PAGE LAYOUT:
%
\textheight=9.9in
\textwidth=6.3in
\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}

\thispagestyle{empty}

\begin{center}
%%
%% Title goes here.
%%
\TITLE{Direct cross section measurement for the  $^{18}\text{O}(p,\gamma)^{19}\text{F}$  reaction at LUNA }\[\3mm]
%%
%% Authors and affiliations are next. The presenter should be
%% underlined as shown below.
%%
\AUTHORS{\u{F. R. Pantaleo1,2, A. Best3,4, G. Imbriani3,4, R. Perrino2 \par for the LUNA Collaboration}

%%
{\small \it
\AFFILIATION{1}{Universita' degli Studi di Bari, Dipartimento Interateneo di Fisica "M. Merlin", Bari, IT}
\AFFILIATION{2}{INFN Bari, IT}
```

```

\AFFILIATION{3}{Universita' degli Studi di Napoli, Dipartimento di Fisica "E. Pancini", Napoli, IT}
\AFFILIATION{4}{INFN Napoli, IT}
}
%%
\vspace{12pt} % Do not modify

% Enter contact e-mail address here.

\centerline{Contact email: {\it francesca.pantaleo@ba.infn.it}}

\vspace{18pt} % Do not modify

\end{center}
%%
%% Abstract proper starts here.
%%
The reaction  $^{18}O(p, \gamma)^{19}F$  plays an important role in the context of Asymptotic Giant Branch (AGB) star evolution and nucleosynthesis. This reaction represents the bridge between CNO and other cycles, which are active during shell H burning. Moreover, the observed O isotope abundance in meteorites crucially depends on the precise knowledge of this rate at low energies.

The low energy cross section of this reaction is influenced by the tails of higher energy broad states and by the presence of a state at 95 keV, which lies directly inside the energy window corresponding to the relevant stellar temperature range.

\In the context of the LUNA experiment we measured the low-energy cross section of this reaction, taking advantage of the low environmental background at the Gran Sasso underground laboratory.

Two setups were used for the experimental campaign: measurements for the determination of the strength of the 95 keV resonance, disputed as predicted by [1,2], were done using a high-efficiency  $4\pi$  BGO detector, whereas gamma-ray branching measurements of the non-resonant low energy component and of higher-energy resonances utilized a high-resolution HPGe detector.

The data taking has been concluded. The current status of the analysis will be presented.

\bigskip
\small
\l noindent[1] M. Q. Buckner et al. Phys. Rev. C 86, 065804 (2012)
\l noindent
[2] H.T. Fortune et al. Phys. Rev. C 015801 (2013)
}
%%
%% End of abstract.
%%
\end{document}

```

Primary author: PANTALEO, Francesca Romana (Universita' degli Studi di Bari, Dipartimento Interateneo di Fisica "M. Merlin", Bari, IT, INFN Bari,Bari, IT)

Co-authors: Dr BEST, Andreas (Universita' degli Studi di Napoli, Dipartimento di Fisica "E. Pancini", Napoli, IT, INFN Napoli, Napoli, IT); Prof. IMBRIANI, Gianluca (Universita' degli Studi di Napoli, Dipartimento di Fisica "E. Pancini", Napoli, IT, INFN Napoli, Napoli,IT); Dr PERRINO, Roberto (INFN Bari, Bari,IT)

Presenter: PANTALEO, Francesca Romana (Universita' degli Studi di Bari, Dipartimento Interateneo di Fisica "M. Merlin", Bari, IT, INFN Bari,Bari, IT)

Session Classification: Direct measurements 1