Contribution ID: **96** Type: **Poster**

The Measurement of Long Lived Alpha Decay for Cosmochronometry

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

```
%
% 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{The Measurement of Long Lived Alpha Decay for Cosmochronometry}\\[3mm]
%%%
%%% Authors and affiliations are next. The presenter should be
%%% underlined as shown below.
%%%
\AUTHORS{Heinrich Wilsenach[1], Kai Zuber[1], R\'ene Heller[2], Volker Neu[3], Yordan Georgiev[4], and Tommy Sch\"onherr[4]}

%%%
{\small \it
\AFFILIATION{1}{IKTP TU-Dresden, Dresden, Germany}
```

\AFFILIATION{2}{Institute of Ion Beam Physics and Materials Research, Dresden-Rossendorf, Germany}
\AFFILIATION{3}{Institute for Metallic Materials, Dresden, Germany}
\AFFILIATION{4}{Transport Phenomena in Nanostructures, Dresden-Rossendorf, Germany}

}
%%%
\vspace{12pt} % Do not modify

% Enter contact e-mail address here.

\centerline{Contact email: {\it heinrich.wilsenach@tu-dresden.de}}

\vspace{18pt} % Do not modify

\end{center}
%%%
%%% Abstract proper starts here.
%%%

Alpha decay has historically given insight into the inner workings of the nucleus as the decay rate is strongly affected by nuclear structure. Very long lived alpha decaying isotopes (about $T_{1/2} = 10^{8-10}$ a) can be used as a powerful tool to date the formation of astronomical objects in the Solar System due to their extremely long half lives. This technique is however very vulnerable to the accuracy of the half-life. This means that improved half-live measurements are important though they pose a significant technical obstacle.

To measure the half-lives of such long lived isotopes besides appropriate targets special care needs to be taken with background and signal efficiency. To overcome these obstacles the design of the twin Frisch-Grid ionisation chamber was chosen [1]. This design combines excellent energy resolution with a hight detector efficiency and the usage of radio-pure materials to measure decay rates in the region of a few counts per day. It is also possible to use pulse shape analysis to obtain position information on each event, allowing for improved signal to background discrimination.

This presentation will give an overview of the detection aspects of the twin Frisch-Grid ionisation chamber, as well as the calibrations that were performed. New measurements of the half-lives of ^{147}Sm and ^{190}Pt will also be presented and discussed here.

\bigskip
{\small

\noindent [1] A. Hartmann et al., NIM A 814, 12 (2016).
%\noindent[2] O. Martell et al. submitted to Solar Physics Letters (2013).}
%%%
%%% End of abstract.
%%%
\end{document}

Primary author: Mr WILSENACH, Heinrich (TU-Dresden, IKTP)

Co-authors: Prof. ZUBER, Kai (IKTP, TU-Dresden); Dr HELLER, Réne (Institut für Ionenstrahlphysik und Materialforschung Helmholtz-Zentrum Dresden-Rossendorf e.V.); Mr SCHÖNHERR, Tommy (Transport Phenomena in Nanostructures, Dresden-Rossendorf); Dr NEU, Volker (IFW Dresden); Dr GEORGIEV, Yordan (Transport Phenomena in Nanostructures, Dresden-Rossendorf)

Presenter: Mr WILSENACH, Heinrich (TU-Dresden, IKTP)

Session Classification: Poster session

Track Classification: Stellar evolution and nucleosynthesis