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Limits on ^{60}Fe/^{26}Al nucleosynthesis ratios from deep-sea sediment AMS measurements

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

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

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\begin{center}
%%%
%%% Title goes here.
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\TITLE{Limits on $^{60}$Fe/$^{26}$Al nucleosynthesis ratios from deep-sea sediment AMS measurements}\\[3mm]
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%%% Authors and affiliations are next. The presenter should be
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%%%
\AUTHORS{J. Feige[1,2], A. Wallner[2,3], L.~K. Fifield[3], R. Golser[2], S. Merchel[4], G. Rugel[4], P. Steier[2],\\ S.~G. Tims[3], S.~R. Winkler[2,5]}

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{\small \it
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%%%
%%% Abstract proper starts here.
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The long-lived radionuclide ^{26}Al ($t_{1/2}\,=\,0.7\,$Myr) has been observed throughout our galaxy, reflecting ongoing nucleosynthesis over the past few million years [1]. It is produced and ejected into the interstellar medium by stellar winds and during supernova explosions. A nearby supernova may leave an imprint of ^{26}Al in terrestrial archives, complementing the observation of supernova-produced ^{60}Fe in deep-sea samples. \\
The same set of sediment samples from the Indian Ocean that showed a distinct ^{60}Fe-signature in layers of ages between 1.7 and 3.2\,Myr [2] was also analyzed for ^{26}Al. However, additional terrestrial sources producing ^{26}Al on Earth, such as cosmogenic production in the atmosphere and in-situ production within the sediment, may obscure a supernova imprint. \\
We used our experimental ^{26}Al data to infer lower limits on ^{60}Fe/^{26}Al nucleosynthesis ratios by comparing the width and the strength of the previously measured ^{60}Fe-signal to our ^{26}Al data. We find that our results generally favour the higher theoretical isotopic supernova ratios and deviate from the observed galactic ^{60}Fe/^{26}Al flux ratio by 2-3 times of the measurement uncertainty.
\bigskip
{\small

\noindent [1] Diehl et al., New Astron. Rev., 52, 440 (2008);

\noindent
[2] Wallner, Feige et al., Nature, 532, 69 (2016).}
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%%% End of abstract.
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\end{document}

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Session Classification: Explosive nucleosynthesis observations

Track Classification: Tools, techniques and facilities