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Direct study of the $^{22}\text{Ne}(\text{p}, \gamma)^{23}\text{Na}$ reaction in inverse kinematics at DRAGON

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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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%% Title goes here.
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\TITLE{Direct study of the  $^{22}\text{Ne}(\text{p}, \gamma)^{23}\text{Na}$  reaction in inverse kinematics at DRAGON}
{\footnote{The authors acknowledge the generous support of the Natural Sciences and
Engineering Research Council of Canada. TRIUMF receives federal funding via a
contribution agreement through the National Research Council of Canada}}\[[3mm]

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%% Authors and affiliations are next. The presenter should be
%% underlined as shown below.
%%
\AUTHORS{A. Lennarz1 \}
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for the DRAGON collaboration}

{\small \it
\AFFILIATION{1}{TRIUMF, Vancouver, Canada}
}
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% Enter contact e-mail address here.
\centerline{Contact email: {\it lennarz@triumf.ca}}
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%%
%% Abstract proper starts here.
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The $^{22}\text{Ne}(\text{p},\gamma)^{23}\text{Na}$ reaction largely impacts the abundance of the only stable sodium isotope, ^{23}Na , in various stellar environments, such as AGB stars, massive enough to undergo hot-bottom burning, type Ia supernovae and novae. However, the $^{22}\text{Ne}(\text{p},\gamma)^{23}\text{Na}$ reaction rate still carries one of the highest uncertainties among the astrophysical reactions involved in the NeNa cycle, thereby also affecting the abundance predictions of elements between ^{20}Ne and ^{27}Al .
Reducing the uncertainties of abundance predictions for NeNa cycle elements by constraining the relevant reaction rates experimentally has received increased attention with the discovery of the anticorrelation between sodium and oxygen abundances in globular cluster stars.
The thermonuclear reaction rate for the $^{22}\text{Ne}(\text{p},\gamma)^{23}\text{Na}$ proton capture reaction is dominated by a number of narrow resonances within the Gamow window.
Recently, a study with the objective to directly measure the strengths of the most relevant resonances in the $^{22}\text{Ne}(\text{p},\gamma)^{23}\text{Na}$ reaction in inverse kinematics was carried out using the DRAGON (Detector of Recoils and Gammas Of Nuclear Reactions) recoil separator at TRIUMF. Resonances within an energy range from $E_{c.m.}=178\sim\text{keV}$ to $E_{c.m.}=1.222\sim\text{keV}$ were investigated.
In this contribution the astrophysical motivation behind this measurement, as well as preliminary results of the first inverse kinematics study of the $^{22}\text{Ne}(\text{p},\gamma)^{23}\text{Na}$ reaction will be presented.

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