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Primordial nucleosynthesis revised: the THM contribution

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\long\def\TITLE#1{{\Large{\bf#1}}}\long\def\AUTHORS#1{ #1\\[3mm]}
\long\def\AFFILIATION#1#2{[1]  #2\\}
\begin{document}
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\begin{center}
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%%% Title goes here.
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\TITLE{Primordial nucleosynthesis revised: the THM contribution}\\[3mm]
%%%
%%% Authors and affiliations are next. The presenter should be
%%% underlined as shown below.
%%%
\AUTHOR{R.G. Pizzone[1], C. Bertulani[3], R. Spart\'a[1,2], C. Spitaleri[1,2], M. La Cognata[1], L. Lamia[2], A. Mukhamedzhanov[4]\\
%%%
{\small \it
\affiliation{[1]INFN - Laboratori Nazionali del Sud, Catania, Italy \\
[2]Dipartimento di Fisica e Astronomia, Universit\'a di Catania, Catania, Italy\\
[3]Department of Physics and Astronomy, Texas A\&M University, Commerce, TX, USA \\
[4] Cyclotron Institute, Texas A\& M University, College Station, TX, USA\\}
%\AFFILIATION{*}{Present address Dipartimento della Protezione Civile, Roma, Italy}
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% Enter contact e-mail address here.

\centerline{Contact email: {\it rgpizzone@lns.infn.it}}

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%%% Abstract proper starts here.
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Big Bang Nucleosynthesis (BBN) nucleosynthesis requires several nuclear physics inputs and, among them, an important role is played by nuclear reaction rates. They are among the most important input for a quantitative description of the early Universe. An up-to-date compilation of direct cross sections of d(d,p)t, d(d,n)^{3}He and ^{3}He(d,p)^{4}He reactions is given, being these ones among the most uncertain bare-nucleus cross sections.

An intense experimental effort has been carried on in the last decade to apply the Trojan Horse Method (THM) to study reactions of relevance for the BBN and measure their astrophysical S(E)-factor. The result of these recent measurements is reviewed and compared with the available direct data.
%Some of the most uncertain bare nucleus cross sections of interest for the primordial nucleosynthesis were then measured by means of the Trojan Horse Method in the energy range relevant for the early phases of the Universe's life. The reaction rates for these reactions (d(d,pt), d(d,^{3}He)n, ^{3}He(d,p)^{4}He and ^{7}Li(p,α)^{4}He) were then calculated and compared with the available compilations.
The reaction rates and the relative error for the four reactions of interest are then numerically calculated in the temperature ranges of relevance for BBN ($0.01 < T_9 < 10$) and compared with up-to-date reaction rate compilations.
Their value were therefore used as input physics for primordial nucleosynthesis calculations in order to evaluate their impact on the calculated primordial abundances of D, ^{3,4}He and ^{7}Li. These ones were then compared with the observational primordial abundance estimates in different astrophysical sites. A comparison was also performed with calculations using other reaction rates compilations available in literature.

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Primary author: PIZZONE, Rosario (INFN-LNS, Catania, Italy)

Presenter: PIZZONE, Rosario (INFN-LNS, Catania, Italy)

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