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Scattering process for the system ${}^7\text{Be}+{}^{208}\text{Pb}$ at near-barrier energies

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\begin{document}
\noindent{\underline{The 12th International Conference on Nucleus-Nucleus Collisions, June 21-26, 2015, Catania, Italy}}

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\begin{center}
{\large \bf Scattering process for the system  ${}^7\text{Be}+{}^{208}\text{Pb}$  at near-barrier energies}
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\begin{center}
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G.~Marquinez-Duran7, I.~Martel7, M.~Nicoletto2, A.~Pakou10, T.~Sava11,
O.~Sgouros10, V.~Soukeras10, L.~Stroe11, N.~Toniolo6}
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We investigated for the first time the reaction dynamics induced by the weakly-bound projectile ${}^7\text{Be}$ ($S_\alpha = 1.584$ MeV) on a ${}^{208}\text{Pb}$ target at three near-barrier energies, namely 37.6, 40.5 and 42.4 MeV.

The ${}^7\text{Be}$ Radioactive Ion Beam was produced with an intensity about 2.5×10^5 pps by means of the facility EXOTIC [1] at INFN-LNL (Italy). Charged reaction products were detected in the angular range $\theta_{cm} = [55^\circ, 165^\circ]$ with the telescope array EXPADES [2].

Fig. 1 shows the preliminary evaluation of the elastic scattering angular distributions together with the results of the optical model analysis.

Fig. 2 presents the reduced reaction cross sections for the systems ${}^{6,7}\text{Li}, {}^7\text{Be} + {}^{208}\text{Pb}$ [3]. Quite unexpectedly, the ${}^7\text{Be}$ reaction cross section data follow the trend individuated by those measured for the reaction induced by the more tightly-bound mirror nucleus ${}^7\text{Li}$ ($S_\alpha = 2.468$ MeV) rather than those obtained for the similarly weakly-bound projectile ${}^6\text{Li}$ ($S_\alpha = 1.475$ MeV).

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\caption[Elastic scattering angular distributions for the system  ${}^7\text{Be} + {}^{208}\text{Pb}$ .]
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\caption[Reduced reaction cross sections for the systems  ${}^{6,7}\text{Li}, {}^7\text{Be} + {}^{208}\text{Pb}$ .]
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[1] F. Farinon \emph{et al.}, Nucl. Instr. Meth. B {\bf 266}, 4097 (2008).
[2] E. Strano \emph{et al.}, Nucl. Instr. Meth. B {\bf 317}, 657 (2013).
[3] N. Keeley \emph{et al.}, Nucl. Phys. A {\bf 571}, 326 (1994).
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