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Elastic scattering of $^{17}\text{O}+^{208}\text{Pb}$ at energies near the Coulomb barrier.

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In the last decades the study of the reaction mechanisms at energies around the Coulomb barrier for halo and weakly bound nuclei has attracted a large interest. The peculiar characteristics of these nuclei can affect deeply their reaction dynamics increasing or enhancing the total reaction cross section and/or specific reaction channels (for instance, breakup, transfer, fusion).

Thus, it is quite important to have a large and reliable systematics of reaction cross section measurements for stable nuclei interacting with light, medium and heavy targets in order to compare the behavior of exotic nuclei with that of stable and strongly bound nuclei.

We measured at the Laboratori Nazionali di Legnaro the elastic scattering process for the system $^{17}\text{O}+^{208}\text{Pb}$ in the energy range 80 - 87 MeV. This measurement, performed within the commissioning of the detection system EXPADES [1], is particularly relevant since ^{17}O is the mirror nucleus of the radioactive and weakly-bound projectile ^{17}F ($S_p = 0.6$ MeV). The elastic scattering angular distributions were analyzed within the framework of the optical model using the code FRESKO [2] to extract the total reaction cross section. The data will be compared with those obtained for the neighboring systems $^{16,18}\text{O}+^{208}\text{Pb}$ and others available in literature [3].

[1] E. Strano et al., Nucl. Instr. and Meth. B 317, 657 (2013).

[2] I.J. Thompson, Comput. Phys. Rep. 2, 167 (1998).

[3] N. Keeley, K.W. Kemper and K. Rusek, Eur. Phys. J. A 50, 145 (2014) and references therein.

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