

Sub-barrier fusion with light exotic nuclei

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New results have been recently published [1,2,3] for the fusion and direct reactions at energies around the barrier with the neutron-rich nucleus ^6He . The data start to shed light on the question raised more than ten years ago, when the peculiar characteristics of light weakly bound nuclei were first observed: **what are the effects on the fusion process of the halo of the neutron rich light nuclei ?** The measurements with ^6He show the new phenomenon of the presence of direct reaction channels with sizeable cross sections at energies even below the Coulomb barrier. While the total absorption cross section is large, the complete fusion process does not show an enhancement due to the coupling to the other reaction channels.

At this stage, it is important to verify these results on other nuclei in this region. Data were already collected for reactions around the Coulomb barrier with weakly bound stable systems like ^9Be and ^6Li [4,5]. For the first time we performed such measurements with a nucleus on the other side of the valley of stability, the proton-rich, weakly-bound unstable nucleus ^7Be . For comparison, data with the mirror nucleus ^7Li were also collected.

In this communication we will mainly present the results of the Nature article on $^6\text{He}+\text{U}$ and give some preliminary results for the $^7\text{Be}+\text{U}$ system.

- [1] R. Raabe et al., Nature 431 (2004) 823.
M. Trotta et al., PRL 84 (2000) 2342
- [2] A. Di Pietro et al., Phys. Rev. C 69 (2004) 044613.
- [3] A. Navin et al., Phys. Rev. C 70, (2004) 044601.
- [4] N. Dasgupta et al., Phys.Rev. C 70 (2004) 024606.
- [5] C. Signorini et al., Phys. Rev. C 67 (2003) 044607.