Sub-barrier fusion and breakup of light halo nuclei *

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Sub-barrier fusion of heavy ions has been historically a very dedicated subject of research. It is very important for the understanding of the quantum mechanical problem of tunnelling and the interplay between static and dynamical degrees of freedom.

Halo nuclei provide a natural workbench to study collective excitation effects and the role of valence nucleons in the process of sub-barrier fusion [1,2]. At collision energies around the Coulomb barrier the coupling between fusion, transfer and breakup reaction channels has been found to be of un-precedent importance [3,4]. During the scattering process the halo wave function is distorted leading to dipole oscillations and strong couplings to the continuum. In this scenario an enhancement of the fusion cross section is often observed as a result of a reduction of the fusion barrier and the strong coupling to breakup and transfer channels [5,6,7].

In this work we present new data for the sub-barrier fusion of the system ^{6}He+^{206}Pb obtained at the radioactive facility at the Centre de Recherche du Cyclotron, Louvain-la-Neuve, Belgium [8]. The cross-sections for the evaporation residue ^{210}Po have been measured in the energy range 14-18 MeV, down to a level of 1 mb. The interplay between fusion, break and transfer reaction channels will be discussed on the basis of previous results obtained at GANIL (Caen, France) [9] and at the Flerov Laboratory of Nuclear Reaction (Dubna, Russia) [7,10].

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