Coulomb barrier scattering of the light halo nuclei ^{6}He and ^{11}Be*

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Experiments of halo nuclei at energies around the Coulomb barrier can provide good quality data on elastic, inelastic and nucleon transfer reactions. The analysis of these data can deliver information about soft excitation modes, coulomb dipole excitation [1], and relevant reaction mechanisms like transfer, fusion [2] and direct projectile breakup [3]. This information turns out to be very important to understand the structure and dynamics of these exotic nuclei.

The nucleus ^{11}Be exhibits a one neutron halo structure, with an extended neutron distribution (the so called “neutron halo”) and relatively low binding energy. For ^{6}He we have a typical two neutron halo structure. The presence of the halo should produce strong absorption effects in the elastic, inelastic and fusion cross sections [4, 5]. The low energy scattering of ^{6}He on heavy targets has been previously investigated in [6, 7], and more recently in the experiments PH189 and PH215 [8, 9] performed at the RIB facility of the CRC at Louvain la Neuve (Belgium). In addition we have investigated the scattering of ^{11}Be at Coulomb barrier energies in the experiment IS444 carried out at the REX-ISOLDE facility at CERN (Geneva, Switzerland).

In this work we present relevant results obtained from scattering experiments of one and two neutron halo (^{11}Be and ^{6}He) at energies around the Coulomb barrier. The scattering of ^{11}Be on Sn and Au targets will be compared with those previously obtained for ^{6}He. Our preliminary results will be used to discuss the role played by dipole excitations (dipole polarizability), and the competition between direct break-up and transfer to continuum.

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