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Reactions induced by 11Be beam at Rex-Isolde

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Elastic scattering and reaction mechanisms around the barrier, in reaction induced by halo nuclei, has been the object of many publications in the last years (see e.g. [1-3] and ref. therein). In collisions induced by halo nuclei, direct reactions, as for instance transfer or break-up, may be favored owing to the low binding energy, the extended tail of the matter distribution and the large Q-value for selected transfer channels. Moreover, the effects of the coupling to the continuum on the fusion cross-section are not fully understood. Experimentally, almost all elastic scattering and reaction mechanism studies around the barrier with halo nuclei have been performed with 2n halo nucleus 6He and only few experiments have been performed with 1n halo 11Be [4,5]. I will present new results obtained at Rex-Isolde and LNS Catania concerning different reaction channels for the collisions 9,10,11Be+64Zn at energy close to the Coulomb barrier. The analysis of elastic scattering shows a damped elastic angular distribution for the collision induced by the 11Be halo nucleus when compared to the ones induced by 9,10Be. Correspondingly, the total reaction cross-section extracted for 11Be+64Zn is more than a factor of two larger than for the other two systems. It will be shown that such an enhancement of the total reaction cross-section with 11Be is due to the presence of strong transfer/break-up channels.

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