REACTION DYNAMICS FOR THE SYSTEMS ^{7}Be,^{8}B+^{208}Pb AT ENERIES AROUND THE COULOMB BARRIER

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The investigation of the reaction dynamics induced by light weakly-bound nuclei at Coulomb barrier energies received a quite significant boost with the advent of Radioactive Ion Beams (RIBs). These studies were originally motivated by the fact that, depending on how the projectile breakup process was treated in the theoretical models, calculations predicted either the enhancement or the hindrance of the sub-barrier fusion cross section. However, it was soon realized that breakup related effects largely increased the sub-barrier total reaction cross section rather than the fusion probability and that this enhancement was mainly due to direct processes. Within this framework, we investigated the reaction dynamics induced at near-barrier energies by the weakly-bound RIBs ^{8}B (S_p = 0.1375 MeV) and ^{7}Be (S_α = 1.586 MeV) on a ^{208}Pb target. Light charged particles produced by direct processes (elastic scattering, inelastic excitations, projectile breakup and transfer channels) were detected in the angular range from θ_{lab} = 15° to 165° by EXPADES, a newly developed telescope array of high-granularity silicon detectors. The experiment with the ^{8}B RIB was performed at RIKEN (Japan), where the ^{8}B beam was produced by means of the CRIB facility, whereas the system ^{7}Be+^{208}Pb was studied at LNL (Italy) with the ^{7}Be RIB delivered by the EXOTIC facility. The elastic scattering differential cross sections, the angular distributions for the main reaction products as well as the theoretical analyses within the optical model framework to extract the total reaction cross sections will be presented and compared with data available for similar systems.