SCATTERING OF THE HALO NUCLEUS 11BE ON A 197AU TARGET AT ENERGIES AROUND THE COULOMB BARRIER

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The discovery of halo nuclei has brought renewed interest in the modeling of nuclear reactions. The dynamics of weakly bound nuclei at energies close to the Coulomb barrier are of great interest due to the interplay between the reaction process and the structure of the projectile. The Coulomb interaction dominates the reaction process with heavy targets, the low binding energy and the strong dipolar polarization contribute to a significant enhancement of the breakup cross section, even below the Coulomb barrier.

In this contribution the elastic, inelastic and breakup differential cross sections of ^{11}Be on ^{197}Au at incident energies around and below the Coulomb barrier will be presented. The experiment was performed at TRIUMF, using the HPGe detector array TIGRESS in coincidence with Silicon detectors for the identification of the Be fragments. The elastic and inelastic channels have been separated for the first time in this energy range. State-of-the-art CDCC calculations including core excitations are able to explain all the scattering distributions simultaneously. Our results show the cross sections depend on the B(E1) distribution to the continuum in ^{11}Be and demonstrate that the reaction mechanism is sensitive to subtle structure features, such as core deformation in a halo nucleus.