



Contribution ID: 236

Type: Poster

## The Coulomb-nuclear interference in the halo breakup

By following a few previous studies considering the reaction dynamics processes that occur between weakly-bound halo nuclei projectiles on heavy targets [1], we report here a more recent study, in which the Coulomb-nuclear interference is investigated as a function of the projectile ground-state binding energy [2]. For that, we take into account a detailed analysis done for the  $8\text{Li}+^{12}\text{C}$  and  $8\text{Li}+^{208}\text{Pb}$  breakup reactions, by assuming an arbitrary range for the  $n-7\text{Li}$  ground-state binding energies, varying from the experimental one 2.03 MeV down to 0.01 MeV. Independently of the target masses, it was shown that the Coulomb breakup cross section depends on the binding energy more strongly than the nuclear breakup cross section, mainly due to the long-range nature of the Coulomb forces and to the electromagnetic transition matrix elements. We provide a clear indication that small nuclear contribution in a Coulomb-dominated reaction does not imply insignificant Coulomb-nuclear interference. This conclusion on the Coulomb-nuclear interference can be mainly attributed to a peripheral interference phenomenon, governed by the small value of the projectile binding energy, which is determining the peripheral range of the nuclear forces, where the Coulomb and nuclear forces can strongly interfere destructively.

### References

- [1] B. Mukeru, M.L. Lekala, J. Lubian and L. Tomio, Nucl. Phys. A 996, 121700 (2020); B. Mukeru, T. Frederico and L. Tomio, Phys. Rev. C 102, 064623 (2020); B. Mukeru and L. Tomio, Chin. Phys. C 46, 014103 (2021); B. Mukeru and L. Tomio, Braz. J. Phys. 51, 157 (2021).  
[2] B. Mukeru, J. Lubian R'ios, L. Tomio, Phys. Rev. C 105, 024603 (2022).

### Topic

Theory

**Authors:** Prof. TOMIO, Lauro (Instituto de Física Teórica, UNESP); Prof. MUKERU, Bahati (University of South Africa); Prof. LUBIAN, Jesus (Universidade Federal Fluminense)

**Presenter:** Prof. TOMIO, Lauro (Instituto de Física Teórica, UNESP)

**Session Classification:** Poster session