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Effect of breakup channel on other reaction mechanisms of the $8\text{B} + 208\text{Pb}$ system at near barrier energies

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In the present work we study the effect of the breakup channel of the proton halo on the other reaction mechanism for the system involving the projectile 8B and a heavy target 208Pb . It is found in the literature that the breakup of neutron-halo projectile damp the elastic scattering angular distributions, especially at angles near the Coulomb – nuclear interference peak. Strong damp was found for the $11\text{Li} + 208\text{Pb}$ [1] system due to $E1$ excitation of the projectile to the continuum states. Some damp was also observed for other systems for reactions involving the 6He neutron halo projectile [2 - 4], due to Coulomb-nuclear breakup interference. Recently Y.Y. Yang et al. [5] measured the elastic scattering angular distribution for the $8\text{B} + 208\text{Pb}$ system at about three times the Coulomb barrier. They found almost no influence of the breakup channel on the elastic scattering at this high energy. Recent work [6] shows that the breakup of the 8B projectile almost does not affect the elastic scattering angular distribution of its interaction with 58Ni . In the present work we show that in the case of the interaction of 8B with heavy target, a damp of the elastic scattering is observed too, mainly dominated by the Coulomb breakup, with a very weak influence of the nuclear breakup. It is observed a contribution of the dipole and quadrupole interactions of the same orders. A strong dependence on the binding energy of 8B is observed in our conclusions. A detail study of the reaction mechanism is performed for the $8\text{B} + 208\text{Pb}$ system at near barrier energies.

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Primary author: Dr JESUS, Lubian (IF, UFF, Brazil)

Co-authors: Prof. LUIS FELIPE, Canto (IF UFRJ); Prof. PAULO ROBERTO, Gomes (If UFF); Mrs JEANNIE, Rangel (IF UFF)

Presenter: Dr JESUS, Lubian (IF, UFF, Brazil)

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