HAW05-2005-020053

Abstract for an Invited Paper for the HAW05 Meeting of the American Physical Society

Fully converged treatment of Coulomb interaction in three-nucleon reactions with two protons A.C. FONSECA, Centro de Física Nuclear da Universidade de Lisboa, P-1649-003 Lisboa, Portugal

The Coulomb interaction between the two protons is included in the calculation of proton-deuteron (pd) elastic scattering and breakup, radiative pd capture and two-body and three-body electromagnetic disintegration of <sup>3</sup>He. The hadron dynamics is based on the purely nucleonic charge-dependent (CD) Bonn potential and its realistic extension CD Bonn +  $\Delta$  to a coupled-channel two-baryon potential, allowing for single virtual  $\Delta$ -isobar excitation that is responsible for a three-nucleon force and the corresponding three-nucleon currents. Calculations are done using integral equations in momentum space. The screening and renormalization approach is employed for including the Coulomb interaction. Convergence of the procedure is found already at screening radii 10 fm < R  $\leq$  30 fm depending on the beam energy. The reliability of the method is demonstrated. The Coulomb effect on observables is seen at low energies for the whole kinematic regime. In pd elastic scattering at higher energies the Coulomb effect is confined to forward scattering angles, while in pd breakup it always shows up in configurations close to pp FSI. In electromagnetic reactions Coulomb competes with other effects in a complicated way leading to an improved description of the data.