Abstract Submitted
for the DNP06 Meeting of
The American Physical Society

Three-body scattering with two charged particles: Application to direct nuclear reactions A.C. FONSECA, A. DELTUVA, Centro de Física Nuclear da Universidade de Lisboa, Portugal — The conventional treatment of direct nuclear reactions involves the use of optical potentials for elastic channels together with Coupled Channel theory or DWBA to describe inelastic or one particle transfer reactions such as (d, p) or (d, n) on a heavier nucleus. The application of exact Faddeev three-body theory to the understanding of these reactions has been always shadowed by the difficulty in dealing with the long range Coulomb interaction between the proton and the heavier target of atomic number Z. Given the progress achieved recently for $p - d$ elastic scattering and breakup [1] we show the results of calculations for the reactions $p(^{11}\mathrm{Be},^{11}\mathrm{Be})p$ and $p(^{11}\mathrm{Be},^{10}\mathrm{Be})d$ at 38.4 MeV per nucleon, taken as a three-body system made up of p, n, and ^{10}Be as an inert core. The same is done for other (p, d) reactions at similar energies. The results show that three-body calculations can provide a competing explanation of the data. Further studies are forthcoming.

[1] A. Deltuva *et al.*, Phys. Rev. C **71**, 054005 (2005).

A. C. Fonseca
Centro de Física Nuclear da Universidade de Lisboa, Portugal

Date submitted: 21 Jun 2006 Electronic form version 1.4