

# Bare potentials in heavy ion fusion

L.F. Canto<sup>1</sup>

<sup>1</sup>*Instituto de Física, Universidade Federal do Rio de Janeiro Cidade Universitária,  
CT Bloco A 21941-972 Rio de Janeiro, RJ - Brazil*

It is well known that channel coupling enhances the fusion cross section at sub-barrier energies. To measure this enhancement, one usually compares the data with the fusion cross section given by tunnelling through the one-dimensional barrier of the bare potential. For this purpose it is then necessary to determine the bare potential or, at least, the barrier parameters associated to it. There are two procedures to determine the bare potential. The first consists of extracting the necessary information from above barrier data, where the influence of the couplings is assumed to be negligible. The second procedure is to adopt a systematic treatment of the optical potential, like the double folding model. Deriving the bare potential from above barrier data has the advantage of being model independent. However, it relies on the assumption that channel couplings do not influence fusion above the Coulomb barrier. The validity of this assumption is questionable in collisions of weakly bound nuclei, where the elastic and the breakup channels are strongly coupled, and it has not been fully checked when other kind of couplings are involved.

In the present work, we check the accuracy of barrier parameters extracted from above barrier data for systems influenced by different kinds of couplings, and compare barrier parameters obtained using different theoretical models.