# Coexistence of fusion hindrance and enhancement in the systems $^{18}$O + $^{58,60,64}$Ni

D. Pereira[1], C. P. Silva[1], J. Lubian[2], E. S. Rossi Jr.[1], L. C. Chamon[1], G. A. P. Nobre[1] and J. J. S. Alves[2]

[1] *Instituto de Física da Universidade de São Paulo, Departamento de Física Nuclear, Caixa Postal 66318, São Paulo, Brazil.*

[2] *Universidade Federal Fluminense, Instituto de Física, Niteroi, Brazil.*

We will present recent coupled-channel (CC) calculation results for the $^{18}$O + $^{58,60,64}$Ni systems in the bombarding energy range $34.5 \leq E_{Lab} \leq 65$ MeV. In the calculations we have used the parameter-free São Paulo potential [1, 2] and the computer code FRESCO. The inelastic target and projectile excitations (inel), (1n) one ($^{18}$O,$^{17}$O) and (2n) two ($^{18}$O,$^{16}$O) neutron transfer reactions were considered as the main channel couplings. The inelastic deformation parameter values and the neutron transfer spectroscopic factors have been obtained from the literature or from earlier experiments. Thus, there is no adjustable parameter in the present calculation, and the overall agreement with the experimental data (fusion, elastic, inelastic and transfer processes) is quite good. Our calculation results (see Fig. 1) predict an unexpected and important fusion hindrance for above-barrier energies, with important contribution of two-neutron transfer channel. The sub-barrier fusion enhancement is not so pronounced as indicated by earlier simplified CC analyses [3, 4] of the same set of fusion experimental data.

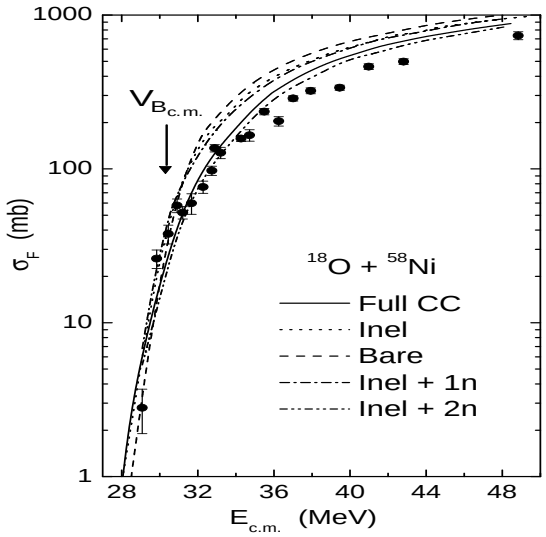


Figure 1: *CC calculation results for the excitation function of the fusion process for the $^{18}$O + $^{58}$Ni system as compared with the experimental data [4].*

## References

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