NUCLEAR SEMINAR SERIES

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Monday, September 24

4:00 pm - Rm 123 NSH

Non-local interactions in (d,p) surrogate method for (n, γ) reactions

A theory for computing cross sections for inclusive A(d,p)X processes has been previously developed [1]. This includes direct neutron transfer to bound states, transfer to the continuum, as well as inelastic processes. Therein, local optical potentials are used to describe the nucleon-target interaction. We extend this framework to investigate the effects of nonlocality in the optical potentials for A(d,p)X reactions populating neutron bound and scattering states. We obtained neutron wave functions for nonlocal interactions of the Perey-Buck type within the R-matrix method [2]. Here, I will discuss the A(d,p)X processes on ^{16}O, ^{40}Ca, ^{48}Ca and ^{208}Pb at 10, 20 and 50 MeV.

[1] G. Potel, F. M. Nunes, and I. J. Thompson, "Establishing a theory for deuteron-induced surrogate reactions," Phys. Rev. C, vol. 92, p. 034611, Sep 2015.

[2] P. Descouvemont and D. Baye, "The R-matrix theory," Reports on Progress in Physics, vol. 73, no. 3, p. 036301, 2010.

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