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Nonlocality in inclusive A(d,p)X transfer reactions¹ WEICHUAN LI, Rutgers University , GREGORY POTEL , FILOMENA NUNES , Michigan State University — 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)B reactions populating neutron bound and unbound states. We also consider the A(d,p)X inclusive transfer cross sections. We obtained neutron wave functions for nonlocal interactions of the Perey-Buck type within the R-matrix method [2]. We have studied A(d,p)X processes on ¹⁶O, ⁴⁰Ca, ⁴⁸Ca, ¹²⁶Sn, ¹³²Sn, and ²⁰⁸Pb at 20 and 50 MeV. We compare the results obtained with local and nonlocal optical potentials and also connect our results with those of [3]. Preliminary results will be presented.

[1] G. Potel, F. M. Nunes, and I. J. Thompson. Establishing a theory for deuteron-induced surrogate reactions. *PRC*, 2015. [2] P Descouvemont and D Baye. The r-matrix theory. *Reports on Progress in Physics*, 2010. [3] L. J. Titus, F. M. Nunes, and G. Potel. Explicit inclusion of nonlocality in (d, p) transfer reactions. *PRC*, 2016.

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