Nonlocal Potentials in Nuclear Reactions LUKE TITUS, FILOM-
ENA NUNES, Michigan State University — In this work we investigate the effect
of nonlocality for single-channel bound and scattering states, as well as in transfer
(p, d) cross sections. We solve the scattering and bound state equations for nonlocal
interactions of the Perey-Buck type [1]. Using the distorted wave Born approxima-
tion, we construct the T matrix for (p, d) on ^{17}O, ^{41}Ca, ^{49}Ca, ^{127}Sn, ^{133}Sn, and ^{209}Pb
at 20 and 50 MeV. If local optical potentials are used in the analysis of experimental
(p, d) cross sections, as compared to the analysis with nonlocal potentials, the spec-
troscopic factors can be affected by approximately 20%. The Perey correction factor
does offer an improvement over taking a direct local equivalent solution. However,
if the desired accuracy is to be better than 10%, the exact solution of the nonlocal
equation should be pursued.

[1] Titus and Nunes, Phys. Rev. **C89**, 034609 (2014).

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