

Abstract Submitted
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Some recent developments in the description of light-nuclei reactions within the NCSM/RGM approach¹ G. HUPIN, LLNL, J. LANGHAMMER, Technische Universitat Darmstadt, C. ROMERO-REDONDO, P. NAVRATIL, TRIUMF, R. ROTH, Technische Universitat Darmstadt, S. QUAGLIONI, LLNL — The fundamental description of both structural properties and reactions of light-nuclei based on nucleon-nucleon and three-nucleon forces derived from first principles is a standing goal in nuclear physics. The *ab initio* no-core shell model when combined with the resonating-group method (NCSM/RGM) [1,2] is capable of describing simultaneously both bound and scattering states in light nuclei, and has already produced promising results starting from a two-body Hamiltonian. Using similarity-renormalization-group evolved two- and three-nucleon interactions [3,4], I will present the first applications to light nuclei binary scattering processes when accounting for the chiral two- plus three-nucleon interaction versus the chiral two-nucleon interaction. Finally, I will outline the progress toward the treatment of three-body clusters within our formalism.

[1] S. Quaglioni and P. Navrátil, PRL **101**, 092501 (2008); PRC **79**, 044606 (2009).
[2] P. Navrátil and S. Quaglioni, PRC **83**, 044609 (2011). [3] E. Jurgenson, P. Navrátil and R. J. Furnstahl, PRC **83**, 034301 (2011). [4] R. Roth, J. Langhammer, A. Calci, S. Binder, and P. Navrátil, PRL **107**, 072501 (2011).

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