

Abstract Submitted
for the DNP15 Meeting of
The American Physical Society

Ab initio NCSMC for three-cluster systems and application to ${}^6\text{He}$ ¹ CAROLINA ROMERO-REDONDO, SOFIA QUAGLIONI, Lawrence Livermore National Laboratory, PETR NAVRÁTIL, TRIUMF, GUILLAUME HUPIN, IN2P3- CNRS — The *Ab initio* no-core shell model/resonating group method (NCSM/RGM) introduced in Ref. [1] is a technique able to describe both structure and reactions in light nuclear systems. This approach combines a microscopic cluster technique with the use of realistic inter-nucleon interactions and a consistent microscopic description of the nucleon clusters. In Refs.[2,3], we introduced the treatment of three-body cluster dynamics, making the approach suitable for the investigation of systems presenting such structure and presented results for ${}^6\text{He}$ within a ${}^4\text{He}(\text{g.s.})+n+n$ basis. In this work, we go a step further and include short-range correlations by means of the no-core shell model with continuum (NCSMC), which couples the NCSM/RGM continuous cluster basis with the A-body NCSM discrete basis. We find that these correlations play an important role in the structure of the ${}^6\text{He}$ ground state and 2_1^+ resonance. We will present results for ${}^6\text{He}$ ground and continuum states as well as initial results for the ${}^5\text{H}$ unbound nucleus within a ${}^3\text{H}+n+n$ basis. [1] S. Quaglioni and P. Navrátil, PRL 101, 092501 (2008). [2] S. Quaglioni, C. Romero-Redondo, P. Navrátil, PRC 88, 034320 (2013). [3] CRR, S. Quaglioni, P. Navrátil and G. Hupin. PRL 113, 032503 (2014)

¹Prepared in part by LLNL under Contract No. DE-AC52-07NA27344. This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics, under Work Proposal No. SCW1158.

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Date submitted: 30 Jun 2015

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