

Abstract Submitted
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Towards α Clustering and α -induced Reactions With The No-Core Shell Model With Continuum¹ KONSTANTINOS KRAVVARIS, SOFIA QUAGLIONI, Lawrence Livermore Natl Lab, PETR NAVRATIL, TRIUMF — The modelling of astrophysical processes is central to predicting the abundance patterns of matter in the universe. Specifically, the behavior of reaction rates at the astrophysically relevant temperatures is a key input to reaction network calculations. Ab initio theory of nuclear reactions may provide predictions for such rates without resorting to phenomenology. However, general applicability is limited to rather light systems due to the complexity of the many-body problem in the energy continuum, and in particular to reactions where the lighter of the two fragments consists of up to two nucleons. We will outline the basics of the no-core shell model with continuum and present a method extending its applicability to the description of α clustering and α -induced reactions. First attempts for the description of α - α scattering with chiral two- and three-nucleon forces will also be presented.

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