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### Microscopic description of nuclear reactions within Coupled Cluster and Gamow Shell Model theories

Nuclei at drip-lines bear unique properties such as halos or resonant character at ground state level, inexistent in the valley of stability. While the latter consists of standard closed quantum systems, drip-line nuclei are open quantum systems, so that models describing their properties must include both nuclear inter-correlations and continuum degrees of freedom. Coupled Cluster and Gamow Shell Model theories, in both ab-initio and effective approaches, are tools of choice for that matter as nuclear correlations are present through configuration mixing while continuum degrees of freedom are imparted by the use of the Berggren basis. The latter methods, initially devised for structure calculations, can now be utilized to study reaction observables. Applications concern direct reactions on light and medium nuclei.

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