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Entanglement in nuclear structure¹

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Entanglement plays a central role in a diverse array of increasingly important research areas, including quantum computing. While extensive suites of investigations have been performed to better understand entanglement in atomic and molecular quantum many-body systems, the exploration of entanglement in the structure of nuclei and their reactions is still in its infancy. In this talk we investigate the entanglement properties of light nuclei in the context of nuclear many-body calculations. In particular, we study the entanglement between single-particles states, or orbitals, in stable and exotic nuclei. The structures of entanglement emerging from different single-particle bases are compared, and possible links with the convergence of observables are explored [1]. We also discuss how such studies could ultimately lead to more efficient many-body schemes, and how they could benefit the developments of hybrid classical-quantum computations of nuclei. [1] C. Robin, M. J. Savage and N. Pillet, arXiv:2007.09157 [nucl-th,quant-ph] (2020).

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