

Some recent progress in ab initio nuclear theory

S. Ragnar Stroberg
University of Notre Dame

I will discuss progress in ab initio nuclear theory over the past few years, particularly focusing on two advances: the solution of the problem of quenching in Gamow-Teller beta decays[1], and the extension of ab initio many-body methods to heavy nuclei [2, 3]. I will then provide an outlook on the current challenges to ab initio many-body theory and some potential ways forward.

References

- [1] P Gysbers, Gaute Hagen, JD Holt, Gustav R Jansen, Titus D Morris, P Navrátil, T Papenbrock, S Quaglioni, A Schwenk, SR Stroberg, and KA Wendt. Discrepancy between experimental and theoretical β -decay rates resolved from first principles. *Nature Physics*, 15(5):428–431, 2019.
- [2] T Miyagi, SR Stroberg, P Navrátil, K Hebeler, and JD Holt. Converged ab initio calculations of heavy nuclei. *Physical Review C*, 105(1):014302, 2022.
- [3] Baishan Hu, Weiguang Jiang, Takayuki Miyagi, Zhonghao Sun, Andreas Ekström, Christian Forssén, Gaute Hagen, Jason D Holt, Thomas Papenbrock, S Ragnar Stroberg, and Ian Vernon. Ab initio predictions link the neutron skin of ^{208}Pb to nuclear forces. *Nature Physics*, 18(10):1196–1200, 2022.