## Objectives

- Predict elastic scattering of nucleons on light nuclei with theoretical uncertainty estimates.
- Use consistent effective field theory (EFT) nucleon-nucleon interactions for both scattering and bound state calculations.
- Apply Bayesian statistical model to infer EFT truncation uncertainties.

Impact

- First nucleon-nucleus scattering calculations using nucleon-nucleon interactions with quantified EFT truncation uncertainties.
- Uncertainties increase with increasing scattering energies.
- Need to incorporate higher orders, as well as consistent three-nucleon interactions.
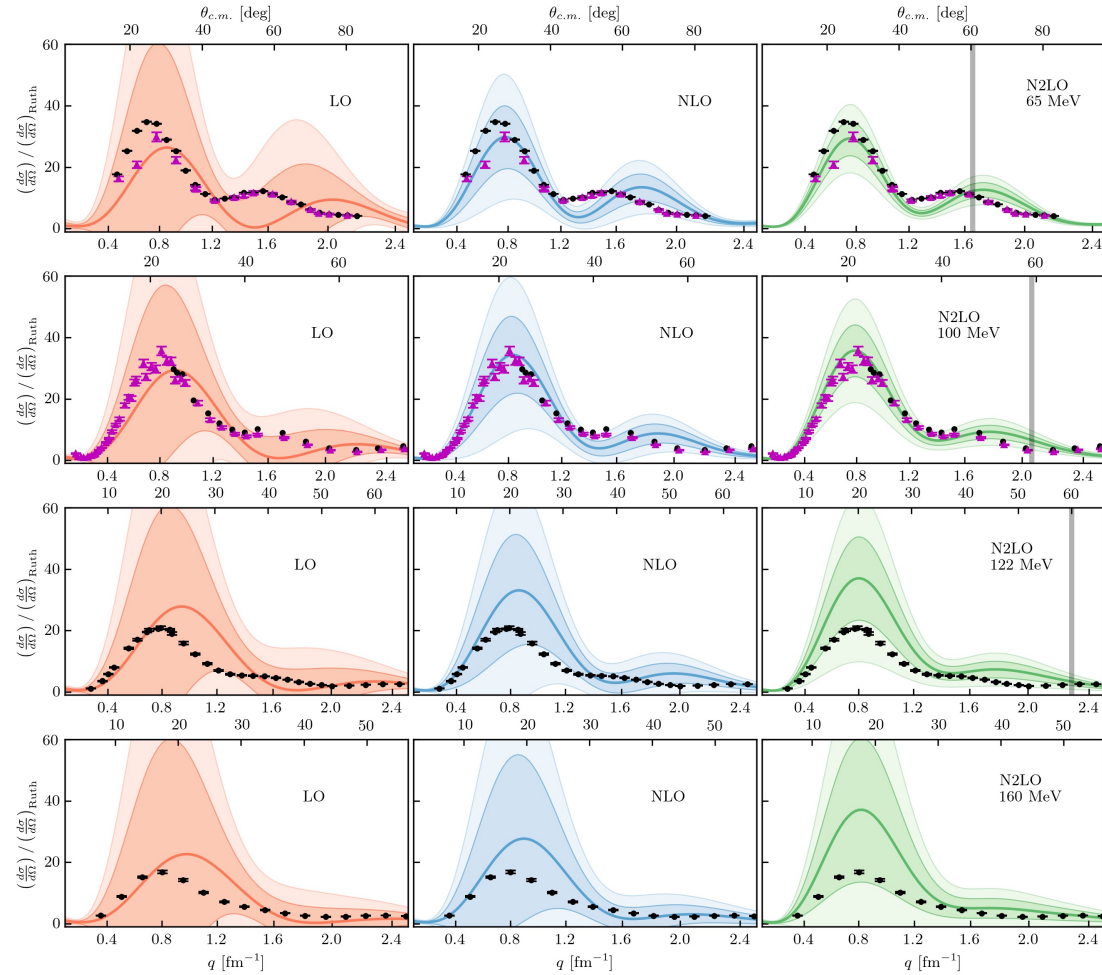
Differential cross section for elastic proton scattering on Carbon-12 with quantified uncertainties.

Accomplishments

R.B. Baker, B. McClung, Ch. Elster, P. Maris, S.P. Weppner, M. Burrows, G. Popa, Phys. Rev. C106, 064605 (2022);
R.B. Baker, M. Burrows, Ch. Elster, K.D. Launey, P. Maris, G. Popa, S.P. Weppner, Front. Phys. 10, 1071971 (2022)