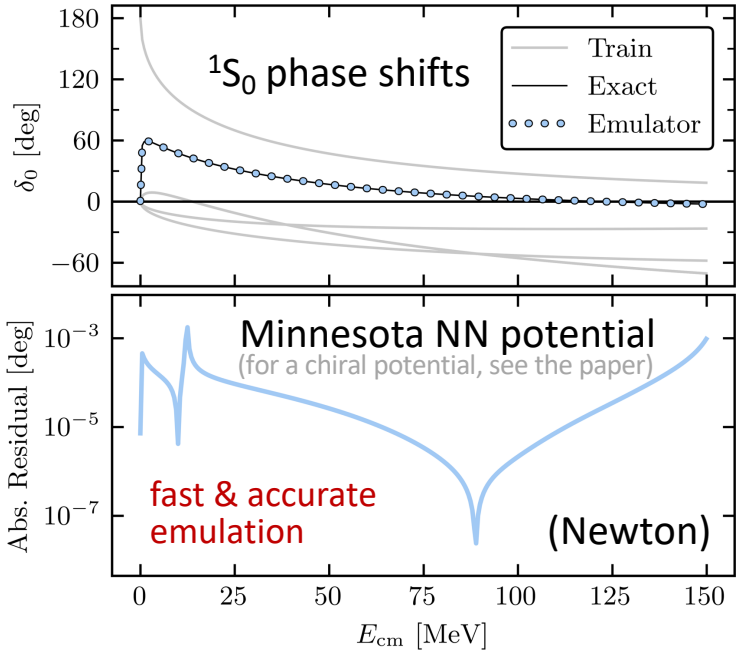
Efficient emulators for two-body scattering observables using eigenvector continuation



EC-driven emulators for bound-state properties are extremely powerful

cf. Ekström *et al.*, König *et al.*, Wesolowski *et al.*

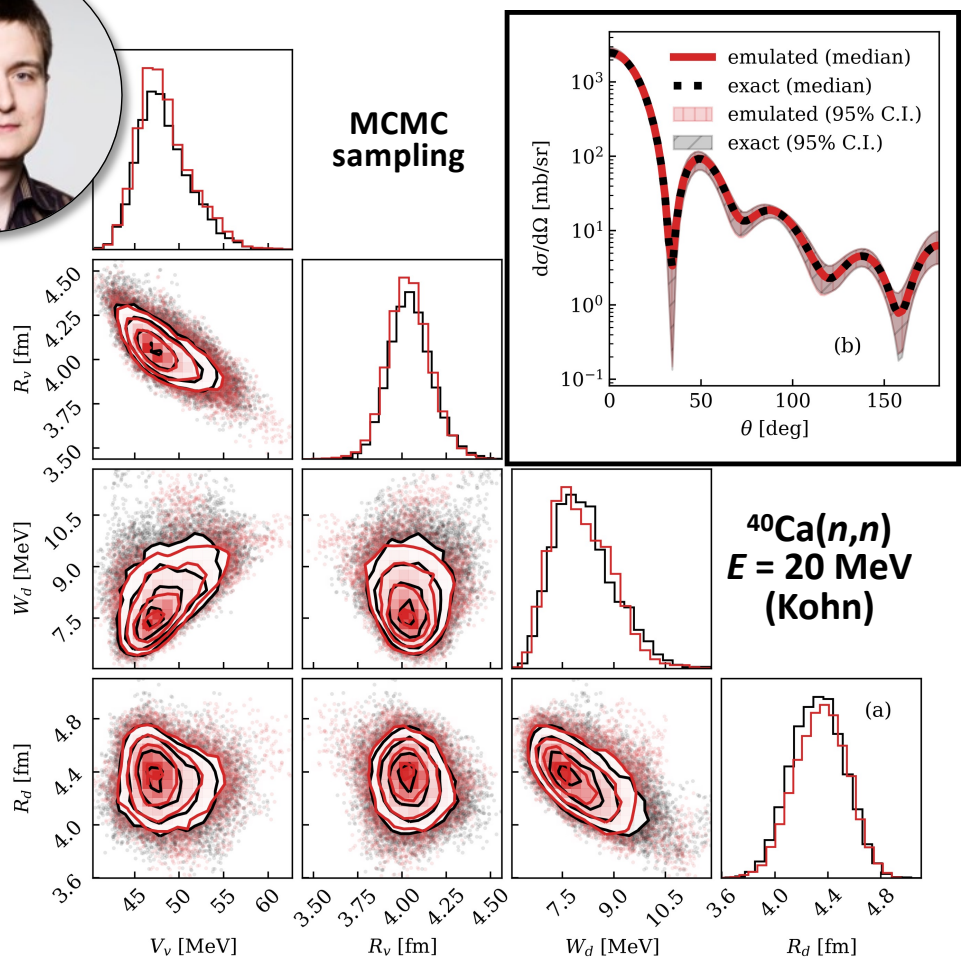
Challenge: extension to scattering and reaction observables for UQ

Furnstahl *et al.*, PLB **809**, 135719

We explored the **variational methods**:

1. Newton (with trial *K* matrices)
2. Kohn (with trial wave functions)

for Newton: Melendez, CD, Garcia, Furnstahl, and Zhang, PLB **821**, 136608

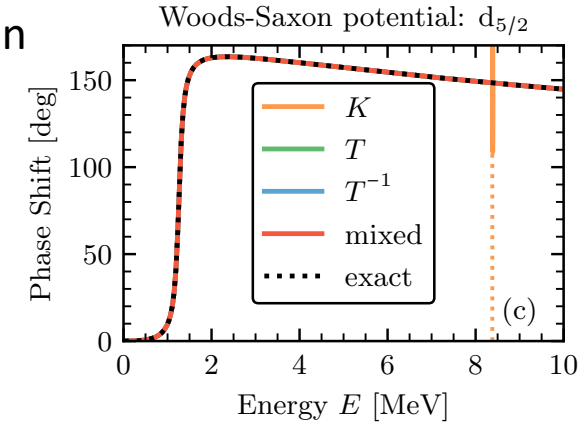


Koning-Delaroche (optical) potential

But: spurious singularities (Kohn anomalies) can render variational calculations *ineffective*

Our approach: detect and remove anomalies using the **general Kohn variational method**

Basic idea: emulate a variety of matrices associated with different scattering boundary conditions at once and check for consistency



Proof of principle: Bayesian parameter estimation with emulated diff. cross sections and mock data from the KD potential

excellent agreement between emulator (red) and exact scattering solution (black)

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CD, Quinonez, Giuliani, Lovell, Nunes, PLB **823** 136777