

Anthony Tropiano
Furnstahl nuclear theory group

The Similarity Renormalization Group in low-energy nuclear theory

In analyzing scattering observables, there is scale and scheme dependence in the factorization of structure and reaction components. The similarity renormalization group (SRG) is well-suited to analyze these components by applying SRG transformations to wave functions and the corresponding operators to evolve to low resolution, tuning the scale with the SRG decoupling parameter. We evolve a high-resolution nucleon-nucleon interaction to low resolution, decoupling the low- and high-energy physics. We show that short-range correlation (SRC) physics is shifted from the wave functions to consistently evolved operators. We demonstrate that a high-resolution description of SRC physics such as the ratio of proton-neutron over proton-proton pairs in nuclei at various relative momenta can be equivalently described with simple calculations at low resolution.