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**The Similarity Renormalization Group with Spurious Deep Bound States**[1] K.A. WENDT, R.J. FURNSTAHL, R.J. PERRY, Ohio State Univ. — Similarity Renormalization Group (SRG) transformations decouple low- and high-energy degrees of freedom. The simplest examples are unitary and fixed by relatively simple flow equations that govern how the effective hamiltonian transforms. We study how decoupling emerges in cases where deeply bound states appear (e.g., spurious bound states in some effective field theories with large cutoff). We show that with the appropriate choice of SRG generator, deeply bound states decouple from low energy physics once the cutoff is lowered below the deep scale. Qualitatively, the high-energy region of the hamiltonian is diagonalized (the analog of integrating out these states) and a universal low-energy effective hamiltonian emerges.

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