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**Benchmarking projected Hartree-Fock as an approximation**<sup>1</sup> STEPHANIE LAUBER, CALVIN JOHNSON, HAYDEN FRYE, San Diego State University — We benchmark angular-momentum projected Hartree-Fock calculations as an approximation to full configuration-interaction results in a shell model basis. For such a simple approximation we find reasonably good agreement between excitation spectra, including for add-A and odd-odd nuclei. Key to this, we argue, is the use of gradient descent. We also find cases where shape-coexistence demonstrably improves the spectrum and make an application to Ge nuclei and experimental results in 40Mg.

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