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The electronic structure of Ce-based 115's FILIP RONNING, Los Alamos National Lab, YUSUKE NOMURA, RYOTARO ARITA, University of Tokyo, HIROAKI IKEDA, University of Kyoto, ANTON KOZHEVNIKOV, ETH, JIANXIN ZHU, Los Alamos National Lab — The Ce and Pu-based 115's embody the notion that reduced dimensionality and increased spin fluctuation energy scales are good for unconventional superconductivity. Often these materials are considered to be quasi two-dimensional systems similar in spirit to the high temperature cuprate superconductors. However, in reality the systems are rather three dimensional. Consequently, we construct an accurate down-folded Hamiltonian from ab-initio electronic structure calculations for the Ce-based 115 materials. We subsequently perform a constrained RPA calculation to obtain effective Coulomb parameters as a starting point to further investigate the magnetic, superconducting, and heavy fermion phenomena which these materials possess.

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