The Actinide Transition Revisited by Gutzwiller Approximation WENHU XU, Brookhaven Natl Lab, NICOLA LANATA, Rutgers University, YONGXIN YAO, Ames Laboratory, GABRIEL KOTLIAR, Rutgers University — We revisit the problem of the actinide transition using the Gutzwiller approximation (GA) in combination with the local density approximation (LDA). In particular, we compute the equilibrium volumes of the actinide series and reproduce the abrupt change of density found experimentally near plutonium as a function of the atomic number. We discuss how this behavior relates with the electron correlations in the $5f$ states, the lattice structure, and the spin-orbit interaction. Our results are in good agreement with the experiments.

Wenhu Xu
Brookhaven Natl Lab

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