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Effective Exchange Interactions for Bad Metals and Implications for Iron-based Superconductors WENXIN DING, Rice University, RONG YU, Renmin University, QIMIAO SI, Rice University, ELIHU ABRAHAMS, University of California Los Angeles — The experimentally observed bad metal behavior in parent iron pnictides and chalcogenides suggests that these systems contain strong electronic correlations and are on the verge of a metal-to-insulator transition. The magnetic excitations in this bad-metal regime mainly derive from the incoherent part of the electronic spectrum away from the Fermi energy. We present a microscopic study of the exchange interactions in such a regime within a slave rotor approach. Generalizations to the multi-orbital case are discussed, as are the implications for the strength of superconducting pairing amplitude in the iron-based superconductors.

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