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High resolution photoemission study of the itinerant magnetism in 5f systems TOMASZ DURAKIEWICZ, CRISTIAN D. BATISTA, JOE D. THOMPSON, LANL, CLIFFORD OLSON, AMES, JOHN JOYCE, LANL, GERRY H. LANDER, JRC-ITE, JAMES E. GUBERNATIS, ELA GUZIEWICZ, MARTIN T. BUTTERFIELD, AL ARKO, LANL, JANEZ BONCA, IJS, KURT MATTENBERGER, OSCAR VOGT, ETH — Magnetic properties of 5f systems as seen by characteristic features in the valence band photoemission are discussed, with particular focus on ferromagnetic uranium compounds. As shown by the authors, electron photoemission experiments demonstrate that the magnetization of the ferromagnetic state of UTe is proportional to the binding energy of the hybridized band centered around 50meV below the Fermi Energy (EF). This proportionality is direct evidence that the ferromagnetism of UTe is itinerant, i.e., the 5f electrons are not fully localized close to the atomic core. A simple model for the observed proportionality between the temperature dependence of the magnetization and the binding energy of the hybridized band near EF is proposed. This model allows an estimate of the effective magnetic interaction and the possibility to identify signatures of itinerant ferromagetism in other materials.

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