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Probing Bulk Electronic Structure with Hard X-ray Angle-Resolved Photoemission ALEXANDER GRAY, SLAC National Accelerator Laboratory, Menlo Park, CA, USA, JAN MINAR, Department of Chemistry, Ludwig Maximillian University, Munich, Germany, SHIGENORI UEDA, NIMS Beamline Station at SPring-8, Hyogo, Japan, JUERGEN BRAUN, HUBERT EBERT, Department of Chemistry, Ludwig Maximillian University, Munich, Germany, OSCAR DUBON, Department of Materials Science and Engineering, University of California Berkeley, Berkeley, CA, USA, KEISUKE KOBAYASHI, NIMS Beamline Station at SPring-8, Hyogo, Japan, CHARLES FADLEY, Department of Physics, University of California Davis, Davis, CA, USA — Traditional ultraviolet and soft x-ray angle-resolved photoemission spectroscopy (ARPES) may in some cases be too strongly influenced by surface effects to be a useful probe of bulk electronic structure. Going to hard x-ray photon energies and thus larger electron inelastic mean-free paths should provide a more accurate picture of bulk electronic structure. I will present the first experimental data for hard x-ray ARPES (HARPES) at energies of 3.2 and 6.0 keV. The systems discussed are W, as a model transition-metal system to illustrate basic principles, and (Ga,Mn)As, as a technologically-relevant ferromagnetic semiconductor material to illustrate the potential broad applicability of this new technique. The experimental results are compared to free-electron final-state model calculations and more precise one-step photoemission theory including matrix element effects. Some likely future applications areas are discussed.

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