

ARPES Studies of Strongly Correlated Electron Systems

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I will present various applications of angle-resolved photoemission spectroscopy (ARPES) in studies of strongly correlated electron systems. The discussed materials will be charge density wave (CDW) systems (ZrTe₃, 2H-TaSe₂), superconductors (Fe_{1.03}Te_{0.94}S_{0.06}, Ni and Co doped Fe_{1+x}Te_{0.65}Se_{0.35}, LuNi₂B₂C) and heavy fermion compounds (CeCoIn₅, Ce₃PdIn₁₁).

A basic application of ARPES is to reveal band structure and Fermi surfaces. However, this method can also probe wave function symmetry, superconducting or CDW energy gaps and even the effects of electron-phonon interactions reflected in self-energy. This will be shown with examples. Such information is important for a proper theoretical description and understanding physical mechanisms determining superconducting or CDW ground state. I will also talk about studies of heavy fermion materials using Ce 4d - 4f resonant spectroscopy, which show different aspects of hybridization between Ce 4f electrons and valence band including heavy fermion dispersions.