

# SPIN-RESOLVED PES OF COMPLEX SYSTEMS

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Several examples of the utilization of spin-resolved photoelectron spectroscopy to investigate complex systems will be discussed. This will include the application of SR-PES to possible half-metallic ferromagnets at the Advanced Light Source at Lawrence Berkeley National Laboratory [1] and the potential of measurements at higher energies, as illustrated by the first spin-resolved photoelectron spectroscopy results from the Advanced Photon Source at Argonne National Laboratory [2]. The utility of the application of SR-PES to non-magnetic systems will also be discussed [3,4], including the investigation of surface states [5] and future potential studies of the correlated electron system  $\delta$ -Pu. [6,7]

1. S.A. Morton, G.D. Waddill, S. Kim, I.K. Schuller, S.A. Chambers, and J.G. Tobin, "Spin-Resolved Photoelectron Spectroscopy of Fe<sub>3</sub>O<sub>4</sub>," *Surface Science Letters* **513**, L451(2002).
2. G.D. Waddill, T. Komesu, and S.A. Morton and J.G. Tobin, <http://www-cms.llnl.gov/s-t/aps.html>.
3. Ch. Roth et al, *Phys. Rev. Lett.* **73**, 1963 (1994).
4. K. Starke et al, *Phys. Rev. B* **53**, 10544 (1996).
5. M. Hochstrasser, J.G. Tobin, E. Rotenberg and S.D. Kevan, "Spin-Resolved Photoemission of Surface States of W(110)-(1X1)H," *Phys. Rev. Lett.* **89**, 216802 (2002).
6. K.T. Moore, M.A. Wall, A.J. Schwartz, B.W. Chung, D.K. Shuh, R.K. Schulze, and J.G. Tobin, "The Failure of Russell-Saunders Coupling in the 5f States of Plutonium", *Phys. Rev. Lett.* **90**, 196404 (2003).
7. J.G. Tobin, B.W. Chung, R. K. Schulze, J. Terry, J. D. Farr, D. K. Shuh, K. Heinzelman, E. Rotenberg, G.D. Waddill, and G. Van der Laan, "Resonant Photoemission in f-electron Systems: Pu and Gd", *Phys. Rev. B* **68**, 1151XX (2003).