Synergistic Opportunities for ARPES and Theory of Correlated Electron Solids

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Angle resolved photoemission spectroscopy (ARPES) continues to evolve technically, to better angular and energy resolutions, wider photon energy ranges, and smaller probe areas. These improved capabilities are yielding ever increasing detail in the experimental knowledge of the single particle electronic structure of solids, especially of novel solids involving strong correlations of various sorts. Extracting the full content of these detailed ARPES data is almost impossible without correspondingly detailed theory to which the data can be compared. Such comparisons are truly meaningful only to the extent that the theory results are both accurate for some interaction model and realistic for the specific solid and the experiment. This talk will present examples of ARPES data for strongly interacting f- and d-electron solids where detailed theory has had[1,2] or could have high impact for the interpretation.

* Work at the University of Michigan suppported by the U. S. National Science Foundation and the U.S. Department of Energy

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[2] J. D. Denlinger, Feng Wang, R. S. Singh, J. W. Allen, K. Rossnagel, S. Elgazzar, P. M. Oppeneer, V. S. Zapf, M. B. Maple, unpublished.