

Abstract Submitted
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Orbital physics in RIXS KRZYSZTOF WOHLFELD, SLAC and Stanford University, PASQUALE MARRA, IFW Dresden, MARKUS GRUENINGER, University of Cologne, THORSTEN SCHMITT, Paul Scherre Institute, JEROEN VAN DEN BRINK, IFW Dresden — In contrast to magnetism, phenomena associated with the orbital degrees of freedom in transition metal oxides had always been considered to be very difficult to observe. However, recently resonant inelastic x-ray scattering (RIXS) has established itself as a perfect probe of the orbital excitations [1] and orbital order [2] in transition metal oxides. Here we give a brief overview of these recent theoretical and experimental advances which have inter alia led to the observation of the separation of the spin and orbital degree of freedom of an electron [1, 3].

[1] J. Schlappa, K. Wohlfeld, K. J. Zhou, M. Mourigal, M. W. Haverkort, V. N. Strocov, L. Hozoi, C. Monney, S. Nishimoto, S. Singh, A. Revcolevschi, J.-S. Caux, L. Patthey, H. M. Rønnow, J. van den Brink, T. Schmitt, *Nature* 485, 82 (2012).

[2] P. Marra, K. Wohlfeld, J. van den Brink, *Phys. Rev. Lett.* 109, 117401 (2012).

[3] K. Wohlfeld, M. Daghofer, S. Nishimoto, G. Khaliullin, J. van den Brink, *Phys. Rev. Lett.* 107, 147201 (2011).

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