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Resonant x-ray reflectivity study of interface reconstructions in LaCoO(3) and other transition-metal-oxide heterostructures VLADIMIR HINKOV, Max-Planck-UBC Centre for Quantum Materials and University of British Columbia, Canada, WOO-SEOK CHOI, Oakridge National Laboratory, U.S.A., JORGE HAMANN-BORRERO, IFW Dresden, Germany and University of British Columbia, Canada, GEORGE A. SAWATZKY, Department of Physics and Astronomy, University of British Columbia, Canada, HO-NYUNG LEE, Oakridge National Laboratory, U.S.A., SEBASTIAN MACKE, Max-Planck-Institut, FKF, Germany and Max-Planck-UBC Centre for Quantum Materials, ABDULLAH RADI, Department of Chemistry, University of British Columbia, Canada — Transition-metal-oxide (TMO) heterostructures offer the opportunity to combine the study of unconventional physical properties with the design of novel functionalities, which are not observed in simple semiconductor or metal heterostructures. In my talk I will concentrate on electronic and chemical reconstructions observed at the interfaces of heterostructures based on LaCoO(3) and other correlated oxides. After briefly summarizing the properties of the novel resonant x-ray technique of orbital reflectometry which we recently used to study the orbital reconstruction in LaNiO(3) heterostructures (Benckiser et al., Nature Materials 10, 189, (2010)), I will discuss the application of this technique, and of usual resonant x-ray reflectometry, to study the electronic and orbital properties at the interfaces and at the surface of LaCoO(3) / LaAlO(3) heterostructures. Finally, I will offer an outlook to the application of orbital reflectometry to other systems.

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