

Abstract Submitted
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New type of in-gap states at a spinel/perovskite interface: combined resonant soft x-ray photoemission spectroscopy and first-principles study.¹ VLADISLAV BORISOV, Goethe University Frankfurt am Main, Germany, PHILIPP SCHUETZ, FLORIAN PFAFF, PHILIPP SCHEIDERER, LENART DUDY, MICHAEL ZAPF, JUDITH GABEL, University of Wuerzburg, Germany, DENNIS VALBJORN CHRISTENSEN, YUNZHONG CHEN, NINI PRYDS, Technical University of Denmark, VLADIMIR STROCOV, VICTOR ROGALEV, Swiss Light Source, Switzerland, CHRISTOPH SCHLUETER, TIEN-LIN LEE, Diamond Light Source, United Kingdom, HARALD O. JESCHKE, ROSER VALENTI, Goethe University Frankfurt am Main, Germany, MICHAEL SING, RALPH CLAESSEN, University of Wuerzburg, Germany — Oxygen vacancies in oxide heterostructures create a plethora of electronic phenomena not observed in the stoichiometric systems. In this talk we will discuss the presence of a new type of in-gap states at the spinel/perovskite γ -Al₂O₃/SrTiO₃ interface [1,2], as observed in soft x-ray resonant photoemission spectroscopy. Based on *ab initio* calculations and crystal-field analysis of different atomic environments, we identify the origin of this behavior and we argue on the possible origin of the extraordinarily high electron mobility measured in this heterostructure [2].

[1] P. Schuetz et al., in preparation.

[2] Y. Z. Chen et al., Nature Communications 4, 1371 (2013).

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