MAR14-2013-020049

Abstract for an Invited Paper
for the MAR14 Meeting of
the American Physical Society

Characterization and control of orbital, spin and charge order in nickel oxide superlattices

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This talk will provide an overview of spectroscopic experiments on the structural [1,2] and electronic [3-7] properties of nickel oxide superlattices grown by pulsed laser deposition and molecular beam epitaxy. We will discuss recent progress in the quantitative characterization of the Ni d-orbital polarization as a function of epitaxial strain, spatial confinement, and chemical composition [4,5] and discuss its influence on spin [6] and charge [7] order in these systems. The power of spectroscopic methods such as resonant x-ray scattering, spectral ellipsometry, and Raman scattering for the characterization of electronic ordering phenomena in metal-oxide heterostructures and superlattices will be emphasized.

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[7] A. Frano, M. Hepting et al., unpublished.