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【601】 Resonant elastic x-ray scattering of oxide multilayers

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Transition-metal oxide heterostructures are attractive for functional device applications because electronic and magnetic phases that are inaccessible in the bulk can be stabilized by epitaxial strain, confinement, charge doping, or interface effects.

We use resonant elastic x-ray scattering to investigate ordering phenomena of spin, charge and orbitals in nanoscale complex oxide multilayers. As a model system we have investigated perovskite-type $RNiO_3$ -based heterostructures (R = rare-earth ion) grown by molecular-beam epitaxy and pulsed-laser deposition on various substrates. In my talk I will present results of our studies of the layer-resolved orbital occupations, the unusual antiferromagnetic order observed in the ultra-thin limit, and the quantitative investigation of the bond-order parameter.

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