

Static and fluctuating stripes in nickelates and cuprates

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Stripes, i.e., the collective order of spin and charge degrees of freedom has been found in doped layered nickelates and in those cuprates where structural distortion break the four-fold rotational symmetry of the planes. For systems without this distortion like the prototypical high-temperature superconductor - (LSCO), magnetic order has been observed but no charge order. This was explained either by the fluctuating character of the charge order, or alternatively by a model of helical magnetic order that does not involve charge order at all.

From resonant soft x-ray diffraction (RSXD) experiments from Sr-doped (LSNO) we know that this technique is sensitive not only to static but also to fluctuating order [1]. We hence used this sensitivity to look for charge-stripe order in 1/8-doped LSCO. We find a pronounced peak at the charge order position at the oxygen K and at the Cu L_{3} resonance. An analysis of the energy and temperature dependence confirms its assignment to charge order.

In the nickelates we find an unusual temperature dependence of the spatial coherence, which decreases not only upon heating but also upon *cooling*. We studied how this effect, in particular the low-temperature disorder, depends on the doping level and if doping by either Sr or excess oxygen leads to a different behaviour.

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[1] J. Schlappa et al., arXiv:0903.0994