

Static and fluctuating stripes in nickelates and cuprates

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Keywords: charge stripe order, cuprates, nickelates

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 ab planes. For systems without this distortion like the prototypical high-temperature superconductor La_2CuO_4 (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 La_2NiO_4 (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 $L_{2,3}$ 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.

Funded by the DFG through SFB 608, and by the BMBF through projects 05KS7PK1 and 05ES3XBA/5.

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