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**X-ray diffraction study of charge density wave fluctuations in  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$  under uniaxial pressure** THOMAS CROFT, CHRISTOPHER LESTER, University of Bristol, ALESSANDRO BOMBARDI, BENJAMIN MOSER, Diamond Light Source, STEPHEN HAYDEN, University of Bristol — Charge density wave (CDW) order now appears to be a universal feature of the cuprate phase diagram.  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$  (LSCO) is a canonical example with a simple crystal structure and  $T_{\text{CDW}} \sim 80$  K. In other 214-cuprates (LBCO, Eu/Nd-LSCO), the onset of CDW order is closely associated with a transition from a low-temperature orthorhombic (LTO) to a low-temperature tetragonal (LTT) phase. Despite lack of long range LTT order in LSCO, several experiments detect the presence of local LTT regions. These may arise from LTO domain boundaries that support the LTT structure and also serve as the origin of the CDW. Here we report X-ray diffraction measurements on LSCO ( $x = 0.13$ ) under applied uniaxial strain. The experiment utilized a piezo-based device allowing the sample to be detwinned *in-situ*. In the absence of applied strain, a transition to the LTO phase is observed at  $\sim 230$  K. LTT type peaks are also observed at this temperature and CDW order is seen to set in  $< 100$  K. On application of compressive strain, the amplitude and onset temperature of LTT and CDW phases are largely unaffected after removing domain boundaries suggesting these phases originate from a fluctuating state within the bulk and are not simply localized around boundary regions.

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