

Abstract Submitted
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Anisotropic dispersion of charge stripe fluctuations in $\text{La}_{1.75}\text{Sr}_{0.25}\text{NiO}_4$ ¹ JOHN TRANQUADA, RUIDAN ZHONG, GENDA GU, Brookhaven Natl Lab, DMITRY REZNIK, U. Colorado, BARRY WINN, ORNL — It has recently been demonstrated that charge stripe fluctuations can be detected in $\text{La}_{2-x}\text{Sr}_x\text{NiO}_4$ by inelastic neutron scattering at temperatures close to the charge-ordering transition [1]. The next step is to characterize the dispersion of these excitations. To do this, we have studied a crystal with $x = 0.25$ using the HYSPEC instrument at the Spallation Neutron Source. The clearest picture has been obtained at a temperature of 160 K, where spin order is absent while the charge order is weak but finite. The effective observation window is limited to $E < 8$ meV, as acoustic phonons dispersing from neighboring Bragg peaks obscure the weak signal of interest at higher energies. Measuring about the charge-order peak at wave vector $(4.4, 3, 0)$, where $a^* = 1.159 \text{ \AA}^{-1}$, we observe a dispersion with a velocity of $\sim 20 \text{ meV-\AA}$ along the stripe-modulation direction, but no clear dispersion in the orthogonal direction. The detected velocity has the scale of lattice, rather than purely electronic, excitations.

[1] S. Anissimova *et al.*, Nat. Commun. **5**, 3467 (2014).

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