Abstract Submitted
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Electron-phonon coupling in 1D edge-shared cuprates probed by resonant soft x-ray scattering[1] STEVEN JOHNSTON, University of Britsh Columbia, W.S. LEE, SLAC National Accelerator Laboratory, Stanford University, B. MORITZ, Northern Illinois University, JEROEN VAN DEN BRINK, IFW-Dresden, Z.-X. SHEN, Stanford University, T.P. DEVEREAUX, SLAC National Accelerator Laboratory, Stanford University — Resonant inelastic x-ray scattering (RIXS) is a powerful probe for studying excitations in strongly correlated systems. With continued advancements of the technique, the overall energy resolution has improved to the point of uncovering low-energy bosonic excitations near the elastic line. In this talk we present evidence for coupling to an optical oxygen phonon in the RIXS spectrum of the quasi-1D edge shared cuprate $Ca_{2+x}Y_{2-x}Cu_5O_{10}$ at the oxygen K-edge. This mode is identified as a compressive mode polarized perpendicular to the chain direction which modulates the Cu-O charge transfer energy which sets the size exchange interaction. By comparing to small cluster calculations we extract a sizable electron-phonon coupling strength and infer an interplay between the electronic, magnetic, and lattice degrees of freedom.

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