Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

**Renormalization of electronic energy scales by electron-phonon interactions in the spin-chain cuprate $Li_2CuO_2$**[1] STEVEN JOHNSTON, University of Tennessee, C. MONNEY, University of Zurich, V. BISOGNI, Brookhaven National Laboratory, K. J. KHOU, Diamond Light Source, R. KRAUS, G. BEHR, IFW Dresden, V. N. STROCOV, Paul Scherrer Institut, J. MALEK, Institute of Physics, ASCR, S.-L. DRECHSLER, IFW Dresden, J. GECK, TU Dresden, T. SCHMITT, Paul Scherrer Institut, J. VAN DEN BRINK, IFW Dresden — Recent advances in resonant inelastic x-ray scattering has improved energy resolution to the point that phonon excitations are now regularly observed in low-dimensional correlated materials. This observation provides a new way to study the electron-phonon interaction in these materials. I will discuss the observations of phonon excitations in the quasi-1D spin-chain cuprate $Li_2CuO_2$. Through detailed modeling of the RIXS spectra over a wide energy range we are able to determine the strength of this interaction. Importantly, we are also able to determine how several fundamental electronic energy scales such as the charge transfer energy and Cu-Cu exchange coupling are renormalized by interactions with the lattice. Our results point to the strong interplay between the lattice, charge, and magnetic excitations in $Li_2CuO_2$ and other low-dimensional cuprates. Ref: S. Johnston *et al.*, Nature Commun. **7**, 10563 (2016).

[1]Supported by the Swiss National Science Foundation, the German Science Foundation within the D-A-CH programme (SNSF Research Grant 200021L 141325 and Grant GE 1647/3-1) and SFB 1143 of the Deutsche Forschungsg.

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Date submitted: 11 Nov 2016 Electronic form version 1.4