

Abstract Submitted
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Electronic structure of quasi-one-dimensional edge-sharing cuprate LiCu_2O_2 single crystals measured by angle-resolved photoemission spectroscopy K.-D. TSUEI, C.-M. CHENG, J.-Y. YUH, National Synchrotron Radiation Research Center, Hsinchu, Taiwan R.O.C., K.W. YEH, M.K. WU, Institute of Physics, Academia Sinica, Taipei, Taiwan, R.O.C. — We have carried out a high resolution angle-resolved photoemission study on edge-sharing quasi-one-dimensional (1D) chain cuprate LiCu_2O_2 single crystals at room temperature. The low energy electron diffraction of cleaved (001) surfaces show a well ordered (2x1) pattern with single domain. Absence of photon energy dependence of high lying peaks just below the Fermi energy in the normal emission spectra suggests localization within the ab-planes. One can identify three dispersive bands between 0.5 eV and 2 eV binding energies along the high symmetry directions along with the off-normal spectra. The highest energy peak is observed at the Y-point with a binding energy 0.55 eV bearing a d_{xy} symmetry based on a polarization dependent selection rule, and can be associated with a hybridized state of primarily Cu $3d_{xy}$ and O $2p$ orbitals, in agreement with a LDA band calculation. We observed no indication of a band maximum at half integral position along GY, predicted by a 1D $t - J$ model. Another peak at 1.3 eV shows a strong dispersion along GX, normal to the chain direction. Its identity will also be discussed.

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