Abstract Submitted
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Metal-insulator transition and electronic structure of quasi-one-dimensional $BaVS_3$ studied by photoemission[1] S.-K. MO, J.W. ALLEN, Univ. of Michigan, H.D. KIM, Pohang Accelerator Lab., E.-J. CHO, Chonnam National Univ., W. TIAN, Univ. of Tennessee, R. JIN, D. MANDRUS, Oak Ridge National Lab., H. HÖCHST, Synchrotron Radiation Center, M. TSUNEKAWA, A. SEKIYAMA, S. SUGA, Osaka Univ. — $BaVS_3$ is a quasi-one-dimensional conductor which undergoes multiple phase transitions at 240K (hexagonal to orthorhombic), 70K ("metal to insulator"), and 35K (paramagnetic to antiferromagnetic). Electrical resistivity shows that one-dimensionality is only marginal in the metallic phase in that the conductivity along the chain direction is only 4 times larger than along the interchain direction. The resistivity is almost temperature independent in the metallic phase with a weak minimum at 130K. We present angle-resolved photoemission (ARPES), high-photon-energy bulk-sensitive PES, and resonant PES spectra of $BaVS_3$. Our data contradict band calculations in which a band crossing the Fermi energy (E_F) provides a sharp density of states at E_F. No distinct Fermi edge was observed in the metallic phase spectra, even with the high photon energy where the surface sensitivity of the spectra is minimized. Rather, from 20K to 150K, an E_F gap of $\approx$ 70meV is filled by spectral weight transfer over a range 0.5eV below E_F.

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