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Electronic Structure of Cu_2N, a Thin-film Insulating Surface SAREH HEIDARI, ANDREW J. FISHER, Department of Physics & Astronomy, University College London, UK; London Centre for Nanotechnology, UK. — Thin-film insulators on metals have been used extensively as substrates when studying single molecule magnets (e.g. $DyPc_2$) and magnetic atoms (e.g. Co) using inelastic tunneling spectroscopy (IETS). They decouple the states of the adsorbed molecule from the underlying metallic bulk, which is necessary for IETS measurements [C. F. Hirjibehedin *et al.*, *Science* 312, 1021, (2006)] and also leads to higher resolution imaging of molecular states [J. Repp *et al.*, *Phys. Rev. Lett.* 9, 026803, (2005)]. The Cu_2N-Cu(100) surface has been shown by STM measurements to have insulating character, however the origin of the insulating behaviour has not been determined. By using Density Functional Theory calculations, we investigate the electronic structure of this surface. We show that the apparent insulating behaviour arises from a strong suppression of the Cu 4s density of states near the Fermi energy in the Cu_2N thin film.

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