

Magnetism of atomically thin NiO films

J.-S. Kim^{*}

Dept. of Physics, Sook-Myung Women's University

As the film becomes atomically thin, the on-site Coulomb interaction energy between two 3p holes of the NiO films on Ag(001) U (Ni 3p) significantly decreases as revealed by both X-ray photoelectron and Auger electron spectroscopies. The reduction of U (Ni 3p) for the ultrathin films is well accounted for by varied image potentials and polarization energies in the films from their bulk values.

Those reduced charge fluctuation energies enhances the coupling constant of the superexchange according to Anderson, which in turn would lead to the increase of the Neel temperature. We estimated the Neel temperature of 3ML-thick NiO in the mean field approximation, which is compatible with the recent experimental observation.