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Magnetic properties of multilayered CoO-ZnO HYEON-JUN LEE, FRANCES HELLMAN, Department of Physics, University of California, Berkeley — The magnetic character of CoO/ZnO multilayers is investigated at low temperature (2 - 100K). Multilayers of CoO/ZnO, with varying nominal thickness of antiferromagnetic insulating (111) cubic CoO (0.7 – 1.6 nm) and semiconducting (002) wurtzite ZnO:Al semiconductor (0.4 – 2.0 nm), were prepared on c-cut sapphire substrate at 550 C by rf-magnetron reactive sputtering. Magnetic, transport, and magnetotransport measurements were carried out over a temperature range of 2 to 100 K. CoO($\sim$1.4 nm)/ZnO($\sim$0.7 nm) shows ferromagnetism with small moment up to 100 K. Up to 10 K there is clear ferromagnetic hysteresis in the out of plane direction and no magnetic hysteresis in-plane. For thicker ZnO, no magnetic properties are observed. We suggest that at low temperature the uncompensated spins in the CoO antiferromagnetic layers are coupled by exchange interaction through the ZnO:Al layer. This research was supported by both DOE and WIN.

Hyeon-Jun Lee
Department of Physics, University of California, Berkeley

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