

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Magnetization and magnetoresistance of ZnO thin film D. F. WANG, V. T. T. THUY, Y. S. LEE, T. W. EOM, G. H. KIM, Y. P. LEE, Hanyang University, Korea — A ZnO film was deposited on a silicon wafer by magnetron sputtering, and the magnetic and the electronic properties have been studied. The magnetic property measurements show that the ZnO film is ferromagnetic at room temperature. The magnetoresistance (MR) measurement reveals a positive MR of 23.3% at 2 K, which is due to the spin splitting induced by the sd exchange interaction. Aging effect, however, was observed when the sample was put under the air for a month. The ferromagnetism disappears and the MR becomes negative, too. It is explained by the modification of the defects in ZnO. The huge magnitude of the spin-dependent MR as well as the aging effect of MR demonstrates that the observed ferromagnetism in ZnO is intrinsic, not from impurity or contamination.

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Date submitted: 19 Nov 2009

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