

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Polar Kerr effect of epitaxial magnetite thin films in the visible and near infrared spectral region JI CHENG, GEORGE STERBINSKY, BRUCE WESSELS, Northwestern University — Magnetite thin films are of interest for spin polarized injection and magneto-electric devices. The polar magneto-optical Kerr effect (MOKE) and optical absorption were measured on epitaxial films over the visible and near infrared spectral region at room temperature. Magnetite thin films on magnesium oxide, strontium titanate, barium titanate and spinel substrates were deposited by molecular beam epitaxy using molecular oxygen and iron. A complex MOKE spectrum was measured over the spectral range of 1.5 to 3.0 eV. A negative transition was observed at 1.6 eV and a positive transition at 2.7 eV. These were previously attributed to intervalence charge transfer and intersublattice charge transfer transitions. The detailed spectrum was dependent upon the substrate suggesting strain may be playing a role. Using MOKE magnetometry the coercive field was measured. The coercive field of the epitaxial film varied from 370 gauss for films deposited on MgO to 620 gauss for films deposited on barium titanate.

Bruce Wessels
Northwestern University

Date submitted: 15 Nov 2006

Electronic form version 1.4