Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Abnormal retention behavior of $Bi_{3.25}La_{0.75}Ti_3O_{12}$ thin films observed by electrostatic force microscopy T.Y. KIM, J.H. LEE, H.R. YOON, Y.J. OH, M.R. CHOI, W. JO, Department of Physics and Division of Nanosciences, Ewha Womans University, FERROELECTRICS-AFM TEAM — We report charge retention in c-axis oriented and preferentially (117) oriented ferroelectric $Bi_{3.25}La_{0.75}Ti_3O_{12}$ thin films by electrostatic force microscopy. Core-level electronic states and local ordering were examined by x-ray photoelectron spectroscopy and extended x-ray absorption fine structure, which are useful to interpret the unique retention behaviors in the films. Raman scattering spectroscopic studies were also used to look into phonon modes of the materials, which are occasionally difficult to understand due to other phases. Surface charges of the films were observed as a function of time in a selected area which consists of a single-poled region and a reverse-poled region. The (117) oriented film shows the extended exponential decay with characteristic scaling exponents, $n \sim 1.5$. The preferentially c-axis oriented film shows retained behaviors regardless of the poling. Decay and retention mechanisms of the regions are explained by space-charge redistribution and trapping of defects in the films.

William Jo
Department of Physics and Division of Nanosciences
Ewha Womans University

Date submitted: 25 Nov 2006 Electronic form version 1.4