Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Homoepitaxial off-stoichiometric $SrTiO_3$ films studied by ultraviolet Raman spectroscopy[1] ANDREW FARRAR, D.A. TENNE, Boise State University, Physics Dept., C.M. BROOKS, Cornell University, Dept. of Materials Science and Engineering, L. FITTING KOURKOUTIS, Cornell University, School of Applied and Engineering Physics, T. HEEG, Cornell University, Dept. of Materials Science and Engineering, J. SCHUBERT, Institute of Bio- and Nanosystems, Forschungszentrum Jülich, Germany, D.A. MULLER, Cornell University, School of Applied and Engineering Physics, D.G. SCHLOM, Cornell University, Dept. of Materials Science and Engineering — Homoepitaxial $Sr_{1+x}TiO_{3+\delta}$ films with -0.2<x<0.25 grown by reactive molecular-beam epitaxy on $SrTiO_3$ (001) substrates have been studied by ultraviolet Raman spectroscopy. Off-stoichiometry for strontium-deficient compositions leads to the appearance of strong first-order Raman scattering at low temperatures, which decreases with increasing temperature and disappears at about 350 K. This indicates the appearance of spontaneous polarization with T_c above room temperature. Strontium-rich samples also show strong first-order Raman signal, but the peaks are significantly broader and exhibit a less pronounced temperature dependence, indicating a stronger contribution of the disorder-activated mechanism in Raman scattering.

[1]Supported in part by NSF, DOE, and Research Corporation for Science Advancement.

Andrew Farrar
Boise State University, Physics Dept.

Date submitted: 18 Dec 2009 Electronic form version 1.4