

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Additional mode of $\text{PbZr}_x\text{Ti}_{1-x}\text{O}_3$ films¹ CHI YAT YAU, Department of Physics, Florida International University, Miami, Florida 33199, RELVA BUCHANAN, Department of Chemical and Materials Engineering, University of Cincinnati, Cincinnati, Ohio 45221-0012 — In addition to the phonon modes predicted by the selection rule, a phonon mode at 45 cm^{-1} (lower than soft mode frequency) was observed in the first order Raman spectrum of ferroelectric $\text{PbZr}_x\text{Ti}_{1-x}\text{O}_3$ films with $x = 0 - 1$. Thus, this additional mode is not a zone-center mode. Its existence in the first order spectrum is due to the zone folding in structures with strain, defect and disorder. This additional mode, like soft mode, also significantly downshifts as approaching the phase boundaries, e.g. at $x = 0.5$ and 0.95 , or with the grain size change. The similar change of the additional mode and the soft mode implies a strong interaction between the soft mode and the additional mode.

¹This work is supported by a NSF Grant: NSF-ECS-0100199.

Chi Yat Yau
Department of Physics, Florida International University,
Miami, Florida 33199, USA

Date submitted: 02 Dec 2006

Electronic form version 1.4