

Abstract Submitted
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Raman Studies of Ferroelectric Domain Walls in Lithium Tantalate and Niobate¹ PAVEL CAPEK, GREG STONE, VOLKMAR DIEROLF, Physics, Lehigh University, CHAD ALTHOUSE, VENKAT GOPALAN, MS&E, Pennsylvania State University — The local structure of ferroelectric domain walls and its dependence on intrinsic defects and dopants is of great interest both from a basic science and an application point of view. For instance, in the ferroelectrics LiNbO_3 and LiTaO_3 that are widely used in nonlinear and electro-optical devices, the stability, shape, switching fields and smallest achievable domain size are determined by the defect concentration. Using confocal Raman spectroscopy we investigated the perturbation of the phonon modes across a domain wall as a function of sample stoichiometry (i.e.: the number of intrinsic defects). For all samples, we find that in the spectral vicinity of the $E(\text{TO}_8)$ and $E(\text{TO}_9)$ the Raman intensity is enhanced in the domain wall region. In order to elucidate the origin of this enhancement, we investigate the directional dispersion of the observed change and perform measurements under variation of pump and probe light polarization and sample orientation. On the basis of these results, we will discuss structural models of the domain wall.

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