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Comparison of the Raman low frequency spectra of NBT and KLT¹ DANIEL JACKSON, RADHA PATTNAIK, Physics Dept., Lehigh University, HAOSU LUO, Shanghai Institute of Ceramics, Chinese Academy of Sciences, DWIGHT VIEHLAND, Materials Science Dept., Virginia Tech, JEAN TOULOUSE, Physics Dept., Lehigh University — We present the results of a detailed comparative study of the low frequency central peak in sodium bismuth titanate ($\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3$ or NBT) and potassium lithium tantalate ($\text{K}_{1-x}\text{Li}_x\text{TaO}_3$ or KLT) from 90 degree angle Raman scattering with a resolution of 1 cm^{-1} . The Raman spectra of NBT were obtained over a wide temperature range from 78 to 950 K, spanning the two transitions, from cubic to tetragonal at $\sim 820\text{ K}$ and tetragonal to rhombohedral in the range 480-600 K. In an effort to better understand the nature of these phase transitions in NBT, we performed a detailed analysis of the central peak and soft mode combined, using different models. In particular, we compare the model in which these two features are uncoupled with the model in which they are coupled with a strength parameter, δ^2 . These models are also discussed in the more general context of A-site substituted ABO_3 perovskites. The effects of an external electric field and mechanical pressure on the transitions will also be discussed.

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Daniel Jackson
Physics Dept., Lehigh University

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