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Investigation of relaxations and central peaks in the Raman spectra of NBT DANIEL JACKSON, JEAN TOULOUSE, Physics Dept. Lehigh University — Raman spectroscopic measurements of sodium bismuth titanate ($Na_{0.5}Bi_{0.5}TiO_3$ or NBT) have been carried out from 80 K to 1000 K using an Ar^+ ion laser at 514.5 nm, with a particular emphasis on its two transitions. Full spectral deconvolution has been performed to examine the temperature evolution of the "central features" and low frequency phonons below 100 cm^{-1}. The central intensity profile is found to be composed of two well-defined Lorenzian peaks, one narrow and the other broad. The temperature dependence of the two central peaks reveals the presence of fluctuations/relaxations in both M and R-point rotations of the oxygen octahedra coupled to the cation displacements, the latter giving rise to polar nano-domains (PND's) and the relaxor behavior. These fluctuations/relaxations are shown to not follow the Bose thermal occupancy factor, similar to central peaks in glasses.

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