

Abstract Submitted  
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**Distribution of Impurities in Lithium Niobate** CHANDRIMA CHATTERJEE, IGOR OSTROVSKII, Univ of Mississippi — The functional parameters of  $\text{LiNbO}_3$  in various acousto-opto-electronic applications are questionable. The nonclassical nonlinear effect such as “acoustical memory” is hardly explained. The present research aims to find new crystal characteristics including the identification of impurities and point defects along the optical crystallographic Z-axis, and normal to the Z-axis. The bulk crystals and wafers are studied. The impurities are identified by their characteristic lines in the photoluminescence spectra, which are taken at room temperature in a range of 350 to 900 nm. The spectra reveal the following point defects: Ar, Ba, Cs, F-center, Rb, Ru, Sn, Fe, K, Li, O, Nb, Kr  $\text{Nb}_{\text{Li}}^{4+}$ , Xe, etc. The peak corresponding to the F-center is found at 400.429 nm and has the highest number of photon counts. The samples are shifted with a step of tens of microns along the Z-axis or normal to it. This allows to find a distribution of the impurities in the samples. The photon counts change with crystal position for some impurities. The distribution of these defects is observed as peaks and valleys. The results may be used to discover the physical mechanisms behind nonclassical nonlinear phenomena in  $\text{LiNbO}_3$ .

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