One- and two-phonon density of states in lithium niobate crystals

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Numerical calculation of the Raman spectral intensity in lithium niobate at phase transition temperature was carried out. Dispersion curves for optical and acoustical phonons over the Brillouin zone were approximated from slow neutron scattering data. It was shown that the experimental observed Raman spectra changes in lithium niobate at the phase transition temperature agree with the theoretical one in the framework of the used model. As a result of the numerical calculation some peculiarities in the acoustic phonon density of states (acoustic biphonon) and the resonant differential phonon state — two-phonon optical bound state were observed.

Keywords: *density of states, phonon, Raman spectra, bound state, lithium niobate*

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