

Abstract Submitted
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Ferroelectric phase transition in the incommensurate phase of the K_2SeO_4 crystal TIGRAN ASLANYAN, Institute for Physical Research, Armenian National Academy of Sciences — It is shown that in the incommensurate (IC) phase of the K_2SeO_4 crystal a phase transition takes place to the ferroelectric IC phase, prior to the lock-in transition to the triple-period commensurate phase. Such a behavior is due to the Lorentz microscopic electric field, which is induced by the IC domains on approaching the lock-in transition temperature. The proposed behavior of the K_2SeO_4 crystal explains the second-harmonic generation, observed in the IC phase, near the lock-in transition. It explains also the observed drop in the crystal's elastic constant c_{55} near the lock-in transition, which corresponds to a significant decrease of the z-polarized sound velocity in the x-direction. Continuous increasing of the polarization in the ferroelectric IC phase manifests itself as a continuous decreasing of the sound velocity. In the same model one can explain also the observation of an overdamped Raman scattering in the $z(xz)y$ geometry in the low temperature range of the IC phase existence. Dielectric properties of the ferroelectric crystals with artificially fabricated domains are discussed.

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