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Slow and fast relaxation times of quantum lattice model with local multi-well potentials: Phenomenological dynamics for $Sn_2P_2S_6$ ferroelectric crystals

Tuesday 30 August 2022 18:00 (1h 30m)

A phenomenological framework for the relaxation dynamics of quantum lattice model with multi-well potentials is given in the case of deformed $Sn_2P_2S_6$ ferroelectric lattice. The framework is based on the combination of statistical equilibrium theory and irreversible thermodynamics. In order to study these dynamics in a connected way we assume that the dipole ordering or polarization (η) and volume deformation (u) can be treated as fluxes and forces in the sense of Onsager theory. From the linear relations between the forces and fluxes the rate equations are derived and characterized by two relaxation times (τ_S, τ_F) which describe the irreversible process near the equilibrium states. The behaviors of τ_S and τ_F in the vicinity of ferroelectric phase transitions are studied.

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