



Many particle approach to resonance Raman scattering in crystals: strong electron-phonon interaction and multi-phonon processes.

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Raman scattering (RS) of light by crystals was studied theoretically taking into account the electron–electron and electron–phonon interactions. The partial diagonalization of the Hamiltonian using unitary transformation was fulfilled. It allowed the structure of the many phonon repetition of bands to be described as a function of the electron–phonon interaction constant. It is shown that the spectral relations obtained for the scattering intensity can describe both the RS and the resonance RS (RRS) processes. Numerical modelling calculations for different parameters were carried out and comparisons with the experimental data for CdS and ZnO crystals were made.

Słowa kluczowe

Raman scattering, Electron–phonon interaction, Multi-phonon excitations

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