



On the vibron dressing in the one-dimensional macromolecular chains caused by the interaction with acoustic phonon modes

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We present a study of the physical properties of the vibrational excitation in the one-dimensional macromolecular chains, caused by the interaction with acoustical phonon modes. The influence of the temperature and the basic system parameters on the vibron dressing has been analyzed by employing the simple mean-field approach based on the variational extension of the Lang-Firsov unitary transformation. Applied approach predicts a region in system parameter space where it is possible of the coexistence of the partially dressed (light and mobile) and fully dressed (immobile) vibron states. We found that the boundary of this region depends on system temperature and type of bond among structure elements in macromolecular chain.

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