DENSITY OF STATES OF SURFACE AND VOLUME EXCITATIONS AND LOCAL OSCILLATIONS IN THE QUASI-LOW-DIMENSIONAL SYSTEMS

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The model of a semi-infinite simple cubic crystal characterized by inlayer interaction α_1 and interlayer interaction α_2 is described. It is considered that α_1 essentially differs from α_2. In this model the peculiarities in the density of states and the condition of appearance of the local vibrations caused by impurities in the subsurface region are investigated analytically. It is studied the cases for $\alpha_1 >> \alpha_2$ (quasi-one-dimensional system) and $\alpha_1 >> \alpha_2$ (quasi-two-dimensional system). It is shown that the peculiarities in the density of states can be treated in terms of two-dimensional projections of isofrequency surfaces. Conditions of generation of surface states and the density of these states are investigated.