ENERGY SPECTRUM AND STATE DIAGRAMS OF ONE-DIMENSIONAL IONIC CONDUCTOR

R. Ya. Stetsiv, I. V. Stasyuk, O. Vorobyov

Institute for Condensed Matter Physics,
Nat. Acad. of Sci. of Ukraine
(*1, Svientsitskyi Str., Lviv 79011, Ukraine;*
e-mail: stetsiv@icmp.lviv.ua)

S u m m a r y

The energy spectrum for a finite one-dimensional ionic conductor with periodic boundary conditions has been calculated using the exact diagonalization technique. The ionic conductor is described in the framework of the lattice model, with particles obeying the "mixed" Pauli statistics. The model involves the ion transfer, interaction between neighbor ions, and modulating field. One-particle spectral densities are calculated, and phase diagrams are plotted for various temperatures, magnitudes of interaction between particles, and modulating field strengths. Conditions for the transition from the charge-density-wave phase to the superfluid one with the Bose–Einstein condensate (it can be an analog of the superionic phase) and to Mott-insulator type phase are investigated.