THE STRUCTURE OF THE GROUND STATE AND LOW-TEMPERATURE THERMODYNAMIC PROPERTIES OF A ONE-DIMENSIONAL ELECTRON LATTICE SYSTEM

V.V. Slavin

Verkin Physico-Technical Institute for Low Temperatures, Nat. Acad. Sci. of Ukraine
(*47, Lenina Prosp., Kharkiv 61103, Ukraine;*
e-mail: slavin@ilt.kharkov.ua)

S u m m a r y

The structure of the ground state and low-temperature thermodynamic properties of a one-dimensional generalized Wigner crystal on a disordered host-lattice are investigated. It is established that the spectrum of elementary excitations has a gapless structure at any finite values of the host-lattice disorder. The instability of the ground state of the system with respect to infinitesimal disturbances of the host-lattice order is discovered. This instability results in the violation of a long-range order in the system. The influence of the long-range action of the interparticle repulsion potential on thermodynamic properties of the system is considered.