ELECTRONIC STRUCTURE AND ATOMIC ORDERING OF $Fe_{0.5}Al_{0.5}$ ALLOY

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S u m m a r y

The influence of the electron-phonon interaction on the density of states for $Fe_{0.5}Al_{0.5}$ alloy is studied in the model of a cluster expansion for the thermodynamic potential of a system of electrons and phonons in the coherent potential approximation. The results of calculations of the density of states for theoretically ordered ($\eta_a = 0.9$) and disordered ($\eta_a = 0$) $Fe_{0.5}Al_{0.5}$ alloy (with and without taking into account the electron-phonon interaction), long-range atomic η_a and magnetic η_m order parameters, and local magnetic moments of constituents of the given alloy are presented. It is shown that the account of the electron-phonon interaction results in the effect of "smoothing" of a pseudogap in the density of states upon the establishment of a long-range ordering in $Fe_{0.5}Al_{0.5}$ alloy. The comparison between the experimentally obtained and theoretically calculated (with and without taking into account the electron-phonon interaction) temperature dependences of the long-range order parameter of $Fe_{0.5}Al_{0.5}$ alloy is performed.