ELECTRONIC PROPERTIES AND MODEL OF THE SPECTRUM FOR f ELECTRON EXCITATIONS IN $CeNi_2Si_2$

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For $CeNi_2Si_2$ compound with unstable valence Ce, the results of an analytic description of electrical resistivity, thermoelectric power, magnetic susceptibility and an electronic component of specific heat on the basis of a model of the local structure of state density (LSSD) proposed by us earlier are presented. It is shown that LSSD near Fermi energy at low temperatures (T < 200 K) is well described by two peaks of the Lorentzian shape that are poorly separated and make a pseudogap. Under high temperatures (T > 400 K) this feature of the energy spectrum is transformed into a single peak, which significantly narrowed and shifted to energy EF. The parameters of the peaks agree qualitatively with the predictable ones in the lattice (low temperature) and impurity (high temperature) Anderson models for Kondo systems with strong orbital degeneracy of f-states. At that the best correspondence of the model to the experimental data in the range temperatures 4 – 800 K is achieved owing to considering the temperature change of only one characteristic parameter - Kondo temperature. It is found that for the description of the dynamic (electrical resistivity, thermoelectric power) and static (magnetic susceptibility, specific heat) properties of $CeNi_2Si_2$ slightly different models for the spectrum of elementary excitations of an f electron should be used.