Two-particle electron correlation function of semi-infinite jellium

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Successive theory of description the electronic subsystem of metal requires the correct calculation of correlation functions of electrons, in particular, two-particle [1,2]. In the case of space bounded system the calculation of such functions becomes considerably more complicated. To illustrate this fact it should be mentioned that while there is a simple algebraic equation for a two-particle correlator in boundary homogeneous system [1] (in random phases approximation), in the case of inhomogeneous system there is an integral equation [3] which can be solved only in the some approximation.

A calculation and research of two-particle correlator of interactive electronic subsystem of the semi-infinity metal in random phases approximation is realized in present work. The surface potential is modeled by different model potentials, allowing to find analytical solution to Schrödinger equation. For the first time the electronic states with energy which is higher than the height of a potential barrier in calculation of two-particle correlator are taken into account. The influence of these states on the behaviour of correlation function is also investigated.

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