

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Conductance of oblate or prolate nanometric metallic particles

NICOLAS GRIGORCHUK, Bogolyubov Institute for Theoretical Physics of NAS of Ukraine, PETRO TOMCHUK, Institute for Physics of NAS of Ukraine — In the frame of kinetic method the conductivity of metallic nanoparticle having the shape of oblate or prolate ellipsoid of revolution in frequencies range, both exceeding, and smaller than the frequency of free run of an electron between walls of a particle is studied. The diffuse reflection of an electron from an intrinsic surface of a particle was chosen as the boundary conditions. For the case, when the electromagnetic wave length is great comparing to the typical sizes of a particle, the analytical expressions for the conductivity of an particle due to the degree of its oblateness or oblongneess and orientation with respect to the direction of an incident radiation are obtained. The dependence of the longitudinal and transverse conductance components on the particle size and electromagnetic radiation frequency is investigated as well. In the case of large eccentricities of particle the agreement with the knowing results for the thin films and thin wires are reached for those components.

Nicolas Grigorchuk
Bogolyubov Institute for Theoretical Physics of NAS of Ukraine

Date submitted: 28 Nov 2006

Electronic form version 1.4