Quantum-Relativistic Nanodiffusion

Abstract

In this paper I present the complete technical analysis of the diffusion function in the hypothesis of quantum-relativistic effects inside a nanostructure, considering a current analytical model, called DS model, having a wide applicability scale range. In the paper the nanoscale is considered, but the presence of a gauge factor inside the model allows its application from sub-pico-level to macro-level. Both theoretical framework is performed and examples of application.

Keywords: Diffusion; Drude-Lorentz-like models; DS model; Nanophysics; Relativistic velocity; Quantum effects; Analytical modelling; Transport processes.

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