

<p><b>Viktor Sverdlov</b></p> <p>Institute of Microelectronics TU Wien Gusshausstrasse 27-29/E-360 1040 Vienna Austria Email: sverdlov@iue.tuwien.ac.at</p> <p><b>Project</b> 05-FONE-FP-008 / Device Electronics Based on Nanowires and Nanotubes (DEWINT)</p>	<p><i>Topic: Device electronics based on nanowires and nanotubes (DEWINT)</i></p> <p><b>On the Role of Off-Diagonal Dephasing in Carbon Nanotube Based Photo-Detectors</b></p> <p>M. Pourfath, V. Sverdlov, and H. Kosina, Institute for Microelectronics, TU Wien</p> <p>The non-equilibrium Green's function (NEGF) formalism is employed to study quantum transport in IR photo detectors based on carbon nanotube field effect transistors (CNT-FETs). The nearest neighbor tight-binding pi-bond model is used to describe the electronic band structure. Scattering is introduced via a self-energy. For electron-phonon interaction the self-energy terms are diagonal in coordinate representation.</p> <p>This local scattering approximation allows one to employ the recursive algorithm for computing the Green's functions. For electron-photon interaction the self-energy, however, contains large off-diagonal terms. We demonstrate that the usually employed local approximation the current is strongly underestimated. For accurate simulations of the photocurrent a large number of off-diagonal terms of the self-energy in coordinate representation must be taken into consideration.</p>
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