

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Nonequilibrium Green's function modelling of quantum well solar cells URS AEERHARD, RUDOLF H. MORF, Condensed Matter Theory, Paul Scherrer Institut — We present a microscopic model of the photocurrent in *GaAs* – *AlGaAs* quantum well solar cells (QWSC), based on the nonequilibrium Green's function formalism (NEGF) for a multiband tight binding Hamiltonian. The quantum kinetic equations of motion are selfconsistently coupled to Poisson's equation. Relaxation and broadening mechanisms are considered by the inclusion of acoustic and optical electron-phonon interaction in a self consistent Born approximation of the scattering selfenergies. The model is applied to different multi-quantum-well systems to investigate the role of device geometry and coupling between the wells.

Urs Aeberhard
Condensed Matter Theory, Paul Scherrer Institut

Date submitted: 18 Nov 2006

Electronic form version 1.4