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**Effects of dislocations on charge transport in a GaAs thin-film solar cell** ANDREY SEMICHAEVSKY, CHANCE BARRETT, The Lincoln University of PA — Dislocations are known to form during the epitaxial growth of GaAs thin films [1]. These extended defects affect the mobility of charge carriers due to scattering. Dislocation scattering affects the open-circuit voltage of and the photocurrent density in a thin-film GaAs solar cell. The mobility degradation due to dislocation scattering in GaAs have been studied both experimentally [2] and theoretically [1]. In this paper we apply a Multiphysics approach [3] to model the transport of charges, including information about dislocation density, morphology, and size. We solve the Schrodinger-Poisson equation to find the scattering potential of an array of dislocations and the Boltzmann transport equation that uses this potential. The photogeneration and recombination terms are explicitly included into the equations. Our model can be of use to applied scientists and engineers in the thin film PV field. [1] J.H. You, H.T. Johnson, Solid State Physics, **61**, 143–261, 2009. [2] T. Wosinski, *Journal of Applied Physics* , **65**, 1566 – 1570, 1989. [3] A.V. Semichaevsky, H.T. Johnson, *Solar Energy Materials and Solar Cells*, **108**, 189-199, 2013.

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