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**Graphene as a transparent conducting electrode for photovoltaics** RAZVAN NISTOR, MARCELO KURODA, AHMED MAAROUF, DENNIS NEWNS, GLENN MARTYNA, IBM T. J. Watson Research Center — Current photovoltaic techonologies rely on expensive oxide films as transparent conducting electrodes (TCEs). With less than two percent absorption per layer and a high carrier mobility, graphene stands as a prominent candidate for TCEs. In this work, we investigate the structural and electronic properties of several doped graphene layers using density functional theory. Of particular interest is the interface between graphene and the semiconducting material of the solar cell, and the effect that various dopants have on the electronic properties of the system. Our aim is to control and quantify the amount of charge transfer to the graphene layers from the dopant molecules. These results can aid the design of carbon based TCEs that have minimum contact barriers with the semiconducting surface and low overall sheet resistances.

Razvan Nistor
IBM T. J. Watson Research Center

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