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Non-Radiative Energy Transfer Into Nanometer-Scale Thin Semiconducting Films JOSEPH GORDON, YURI GARTSTEIN, University of Texas at Dallas — Non-radiative energy transfer (NRET) has gained a lot of attention recently due to its possible utility in new generations of light-emitting and photovoltaic devices. In this process, a "donor" species in an excited state transfers its excitation energy resonantly to an "acceptor" species. A classical realization of NRET is Förster ET between two point-like species. Our interest is in ET between a small donor and an ultrathin acceptor layer. The layers can be realized as planar ensembles of molecules or QDs or as a thin crystalline semiconductor slab. We use two complementary approaches to study the effects of dielectric polarization in thin layers on ET rates: (1) The classical macroscopic electrodynamics treating the acceptor layer as a continuum of certain dielectric permittivity; (2) A direct modeling utilizing planar acceptor lattices, each of the acceptors treated as a polarizable point dipole. Comparison of the results allows us to establish salient qualitative features as well as to clarify the role of local-field factors. Of particular interest is our finding a broad region of the dielectric responses where ET into thinner films *counter-intuitively* turns out to be more efficient than ET into thicker films.

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