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Non-radiative Energy Transfer in Colloidal Nanocrystals/Silicon Hybrid Structures HUE MINH NGUYEN, The University of Texas at Dallas, Department of Physics, OLIVER SEITZ, DAMIEN AUREAU, AMANDEEP SRA, YVES CHABAL, The University of Texas at Dallas, Department of Materials Science, ANTON MALKO, The University of Texas at Dallas, Department of Physics — The integration of organic and inorganic materials at the nanoscale offers the possibility of developing new photonic devices that could potentially combine the advantages of both classes of materials. Such optoelectronic structures could work both in photovoltaic as well as in light emitting modes depending on the direction of non-radiative *exciton* energy transfer (NRET). In present work, we studied hybrid structures consisting of a monolayer of the colloidal nanocrystal quantum dots (NQDs) grafted on hydrogenated Si surface via amine modified carboxy-alkyl chains linkers. Such approach allowed us to passivate Si surface to suppress non-radiative surface state defects (N_s $<<10^{11}$ cm^2) and provided with the controllable spacer lengths between NQDs and Si. We performed systematic measurements of NRET via time-resolved and steady-state photoluminescence (PL) in the range of 10K to 300K and as a function of spacer lengths and quantified NRET rates. Local field effects due to the acceptor surface (Si) are discussed.

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