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Optical behavior of nanocrystal quantum dots adsorbed on crystalline semiconductor substrates: Evidence for energy transfer SIYUAN LU, ATUL KONKAR, ANUPAM MADHUKAR, University of Southern California — Integration of epitaxical and colloidal semiconductor nanostructures into hybrid structures can potentially open unprecedented functionalities that combine the strengths of the epitaxical nanostructures in optoelectronics with the versatility of the nanocrystal quantum dots (NCQDs) and their application in solution environment. Here we report on a photoluminescence study of InAs/ZnSe NCQDs adsorbed on GaAs(001) surface with or without buried near surface quantum nanostructures. Quenching of NCQDs luminescence is observed when the excitation energy goes above the GaAs bandgap, providing the first evidence of excitation energy transfer from high excited states of NCQDs into the substrate. work is supported by DARPA/AFOSR under the DURINT program.

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