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Tuning the parameters to establish Quenching and enhancement regimes in hybrid Gold nanoparticles and CdSe Quantum dots monolayer[1] LAXMINARAYAN TRIPATHI, PRAVEENA M., J.K. BASU, Department of Physics, Indian Institute of science, Bangalore, India — The multicomponent nanomaterials combine the individual properties and give rise to emergent phenomenon. Optical excitations in such hybrid nonmaterial's (for example Exciton in semiconductor quantum dots and Plasmon in Metal nanomaterials) undergo strong weak electromagnetic coupling. Such exciton-plasmon interactions allow design of absorption and emission properties, control of nanoscale energy-transfer processes, and creation of new excitations in the strong coupling regime.This Exciton plasmon interaction in hybrid nanomaterial can lead to both enhancement in the emission as well as quenching. In this work we prepared close-packed hybrid monolayer of thiol capped CdSe and gold nanoparticles. They exhibit both the Quenching and enhancements the in PL emission.The systematic variance of PL from such hybrid nanomaterials monolayer is studied by tuning the Number ratio of Gold per Quantum dots, the surface density of QDs and the spectral overlap of emission spectrum of QD and absorption spectrum of Gold nanoparticles. Role of Localized surface Plasmon which not only leads to quenching but strong enhancements as well, is explored.

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