

Abstract Submitted
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Controlling decay dynamics of quantum emitters with Plasmonic self assembly templates¹ S.R.K.CHAITANYA INDUKURI, IISc, J.K. BASU, Department of Physics, IISc, India — Controlling the emission of quantum dots by tailoring local density of states (LDOS) in self assembled plasmonic template. Using very small diameter gold (Au) spherical nanoantenna within a polymer template randomly dispersed with quantum dots, we show how the photoluminescence intensity and lifetime anisotropy of these dots can be significantly enhanced through LDOS tuning. We also studied the effect of dispersion, wider range of geometric and spectral parameters bringing out the versatility of these functional plasmonic templates. We studied the effect of nano antenna distribution on radiative and non radiative decay rates in the templates. We demonstrated that the decay dynamics in the plasmonic templates can be controlled in a facile manner by changing the filling fraction of the Au nanoparticles. This polarization dependent anisotropic decay dynamics for the quantum emitters is determined by polarization dependent LDOS of the plasmonic templates as demonstrated by FDTD simulations. Our work provides a new method to achieve spontaneous emission intensity and anisotropy enhancement with nanoscale plasmon resonators for applications from controlled photon emitters to light harvesting.

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