Energy transfer between quantum emitters mediated by plasmonic waveguides

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The spontaneous emission properties of a quantum emitter can be affected by the presence of neighbour structures [1], due to the modification of the partial local density of states accessible from the emitter. Nearby metallic waveguides could enhance the decay rate into guided plasmonic modes compared with the rest of decay channels [2]. The above property enables strong and coherent coupling due to the small volume associated with the subwalength confinement inherent in these modes [3], making them efficient energy carriers between emitters [4].

We present calculations studying the decay rates of an emitter in presence of neighbour metallic waveguides and the plasmonic energy transfer between two emitters coupled to them. These properties can be studied classically through the emitted power in the weak coupling regime replacing the quantum emitter by a classical dipole [5].

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