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Exciton Energy Transfer between Quantum Dots in Photon-Confined Systems KAIJIE XU, CARLO PIERMAROCCHI — We address fundamental theoretical aspects of the exciton energy transfer between two quantum dots embedded in dielectric structures that confine photonic modes. We focus on how the photon density of states in these structures can affect the energy transfer mechanism. We will consider the case of two quantum dots in a planar micro-cavity and in a one-dimensional waveguide. We compute the dynamics of excitons and photons during the transfer between the two dots, assuming that we have only one exciton in one dot as initial condition. We study the dependence of the transition rate on the inter-dot distance and compare our result to the Forster mechanism. The effect of dissipation by phonon emission in the energy transfer process will also be discussed. We show how the interplay of phonons and confined photons can affect the standard picture of the exciton energy transfer based on a dipolar interaction.

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