

Abstract Submitted
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Cooperative amplification of energy transfer in plasmonic systems

T.V. SHAHBAZYAN, Jackson State University, V.N. PUSTOVIT, A.M. URBAS, Air Force Research Laboratory — We study cooperative effects in energy transfer (ET) from an ensemble of donors to an acceptor near a plasmonic nanostructure. We demonstrate that in cooperative regime ET takes place from plasmonic superradiant and subradiant states rather than from individual donors leading to a significant increase of ET efficiency. The cooperative amplification of ET relies on the large coupling of superradiant states to external fields and on the slow decay rate of subradiant states. We show that superradiant and subradiant ET mechanisms are efficient in different energy domains and therefore can be utilized independently. We present numerical results demonstrating the amplification effect for a layer of donors and an acceptor on a spherical plasmonic nanoparticle.

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