

Abstract Submitted
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Exciton-plasmon interactions in carbon nanotube arrays.¹ DAVID DROSDOFF, IGOR BONDAREV, North Carolina Central University — The response properties of semiconducting carbon nanotubes (CNs) allow for the excitation of both plasmons and excitons at optical frequencies, which can interact with each other to give rise to a variety of phenomena and applications [1-3]. If carbon nanotubes are aligned in a periodic array, then energy bands can be formed due to the array periodicity. Using a quantum electrodynamics approach, the energy dispersion relation for the coupled exciton and plasmon excitations in the CN array is theoretically analyzed. The predicted result is the formation of photonic bands, which may give rise to tunable optoelectronic devices and other applications. [1] I.V.Bondarev, L.M.Woods, and K.Tatur, PRB 80, 085407 (2009); [2] I.V.Bondarev, PRB 85, 035448 (2012); [3] I.V.Bondarev and A.V.Meliksetyan, PRB 89, 045414 (2014).

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David Drosdoff
North Carolina Central University

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