Abstract Submitted
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Atomic Entanglement in Carbon Nanotubes.[1] IGOR BONDAREV, BRANISLAV VLAHOVIC, North Carolina Central University — The development of materials that may host quantum coherent states is a critical research problem for the nearest future. Recent progress in the growth of centimeter-long small-diameter single-walled carbon nanotubes (CNs)[1] and successful experiments on the encapsulation of single atoms into CNs[2], stimulate the study of dynamical quantum processes in atomically doped CN systems. We have recently shown[3] that atomic states may be strongly coupled to vacuum surface photonic modes in the CN, thus forming quasi-1D cavity polaritons similar to those observed for quantum dots in semiconductor nanocavities[4], which were recently suggested to be a possible way to produce the excitonic qubit entanglement[5]. Here, we show that, being strongly coupled to the (resonator-like) cylindrical nanotube environment, the two atomic quasi-1D polaritons can be easily entangled as well, thus challenging a novel alternative approach towards quantum information transfer over centimeter-long distances.
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