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The discovery of Einstein's nonlocal hidden variables

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In a twelve year experiment conducted from 2000-2012, unambiguous empirical evidence was obtained that confirmed Albert Einstein's notion of hidden variables that would provide a more complete theory of reality. Although these variables are not local as Einstein had predicted, the unequivocal evidence has shown that he was correct with his conclusion that quantum mechanics was not a complete theory. The construct of the experiment revealed that energy is not conserved and that there has never been or ever will be an experiment conducted without these hidden parameters which are not accounted for in quantum mechanics. In addition, the findings revealed that the methodology of predicting effects to establish cause in order to validate theories is also incomplete and thus previously established experimental validations will need to be reevaluated to account for the omission of these fundamental variables.

Biography

Manuel S Morales is an independent researcher in the field of fundamental mechanics, i.e., prephysics. He has a BFA in illustration and AS in photography. His career as an artist inadvertently led to conducting the twelve year Tempt Destiny experiment and to the study of physics, epistemology, ontology, topology, mathematics, and formal logic. He applied his findings to particle physics in a peer-reviewed article entitled, "Assumed Higgs Boson Discovery Proved Einstein Right" which was published in a *Fundamental Physics Journal*.

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Quenching of photoluminescence in quantum dot, metallic nanoparticles and grapheme hybrid nanomaterials

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We investigated the quenching of photoluminescence in a quantum dot (QD)- metallic nanoparticles and metallic grapheme film (QD-MN-G) hybrid system deposited on a dielectric material such as Si. The surface plasmon polaritons (SPPs) are calculated solving the Maxwell equations for the graphene and the dielectric heterostructure in the quasi-static approximation. QDs have excitons which interact with SPPs of graphene-dielectric heterostructure. Photoluminescence (PL) of QD is found by using the quantum density matrix method in the presence of exciton-SPPs coupling. Numerical simulations for the PL spectrum in the QD are performed for (QD-MN-G) hybrid system. It is found that when the exciton energy of the QD is in resonant with the SPP energy the intensity of the photoluminescence is quenched. The PL quenching occurs is due to the transfer of photon energy from the QD to the graphene film and MN due to the exciton-SPP coupling. Furthermore, when the exciton energy is non-resonant with the SPP energy the PL quenching disappears. The energy transfer from the QDs to the graphene film can be switched ON and OFF by mismatching the resonant energies of excitons and polaritons. The mismatching of energies can be achieved by applying external pump lasers or stress and strain fields. Recently Dong et al. and Zeng et al. have measured the PL spectrum of QDs in QD-G hybrid and QD-MN-G hybrid, respectively. In both experiments they have observed the PL quenching. We have compared our theory with these experiments and found a good agreement between theory and experiments. These are interesting findings and they can be used to fabricate switches and sensors by using graphene nanocomposites.

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