

Violation of classical inequalities in nanostructured systems

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A theoretical study of the quantum properties of nanostructured systems is presented by paying special attention to two questions:

1. Analysis of the quantum character of light emitted by quantum dots. In order to properly address experimental information, we focus on the effect of finite band width of detectors, i.e. frequency filtering, on the violation of both Cauchy-Schwarz and Bell classical inequalities [1].
2. Study of time correlations and violation of Leggett-Garg inequalities for detecting and characterizing quantum phase transitions in spin-chains [2].

[1] C. Sánchez-Munoz et al., Phys. Rev. A, 90, 052111 (2014).

[2] F.J. Gómez-Ruiz et al., Phys. Rev. B, 93, 035441 (2016).