

Excitonic fine structure in nanowire quantum dot molecules

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The bright exciton splitting in nanosystems and its origins are of primary importance for quantum-dot-based entangled-photon-pair generation [1]. In this work, we investigate the excitonic fine structure for a double InAs quantum dot embedded into a InP nanowire. We study fine structure details for both direct and indirect excitons confined within a quantum dot molecule. We compare several nanosystems of different sizes and chemical compositions and analyze excitonic properties as a function of constituent quantum dots separation and external electric field. Our results indicate that high-symmetry of nanowire quantum molecule leads to strongly reduced fine structure splitting, for both direct and indirect excitons. Additionally, for certain systems, we find increased oscillator strengths of dark excitons.

[1] M. Zielinski, *Phys. Rev. B.* **88**, 155319 (2013).