



TABLE II. Transition energy E_{tr}

Oscillator strength Figure 2(d) shows a moderate change of the oscillator strength, in the range of 10%, with varying field in the range of ± 100 to ± 100 kV/cm.

How to select QDs with small s_0 . Our present work shows that GaAs QDs are good candidates to achieve small FSS via vertical electric field, but also that rather large fluctuations of s_0 should be expected within one homogenous set of QDs (that differ only by random alloy effects and have the same shape, size, and composition). A selection of appropriate QDs (as practiced experimentally^{27,28}) will therefore be advantageous, if not necessary. From Eq(5) and (6) at zero field ($F = 0$)

- ²⁴L.-W. Wang and A. Zunger, *Phys. Rev. B* **59**, 15806 (1999).
- ²⁵G. Bester and A. Zunger, *Phys. Rev. B* **72**, 165334 (2005).
- ²⁶A. Franceschetti, H. Fu, L.-W. Wang, and A. Zunger, *Phys. Rev. B* **60**, 1819 (1999).
- ²⁷R. J. Young, R. M. Stevenson, A. J. Shields, P. Atkinson, K. Cooper, D. A. Ritchie, K. M. Groom, A. I. Tartakovskii, and M. S. Skolnick, *Phys. Rev. B* **72**, 113305 (2005).
- ²⁸R. M. Stevenson, C. L. Salter, J. Nilsson, A. J. Bennett, M. B. Ward, I. Farrer, D. A. Ritchie, and A. J. Shields, *Phys. Rev. Lett.* **108**, 040503 (2012).
- ²⁹M. M. Vogel, S. M. Ulrich, R. Hafenbrak, P. Michler, L. Wang, A. Rastelli, and O. G. Schmidt, *Appl. Phys. Lett.* **91**, 051904 (2007).
- ³⁰M. Jaros, *Rep. Prog. Phys.* **48**, 1091 (1985).