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# **Exciton Dynamics in InSb Colloidal Quantum Dots**

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## References

- (1) Chang, A. Y.; Liu, W.; Talapin, D. V.; Schaller, R. D. ACS Nano 2014, 8, 8513-8519.
- (2) The presence of specific capping agents and solutions is accounted for by the appropriate choice of the dielectric constant outside the dot,<sup>3</sup> in this case  $\epsilon = 2.5$ .
- (3) Wang, L.-W.; Califano, M.; Zunger, A.; Franceschetti, A. *Phys. Rev. Lett.* **2003**, *91*, 056404.

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S 1: Calculated AR times for oleic-acid-capped InSb (R = 2.1 nm, blue curve and red symbol) and InAs (R = 2.0 nm, green curve and green symbol) dots in tetrachloroethylene<sup>1,2</sup> plotted as a function of  $\Delta E_g$ , the variation of the energy gap around the value calculated for this size ( $\Delta E_g = 0$ ), for a range of energies corresponding to a 5% size distribution in InSb CQDs. The green symbol is slightly displaced to the right for clarity. The black arrows indicate the largest variations of  $\tau_{XX}$  in this energy interval, compared to its value at  $\Delta E_g = 0$ , and are represented as asymmetric error bars in the symbols: if  $\tau(\Delta E = 0)$  is located at a maximum of the curve, the error bar will appear only towards smaller values (this is the case, e.g., for  $\tau(D = 4.18 \text{ nm})$  in Fig. 5), whereas the opposite is true in the case of  $\tau(\Delta E = 0)$  being at a minimum (see  $\tau(D = 4.96 \text{ nm})$  in Fig. 5). This procedure is applied to determine the error bars for all theoretical data appearing in Figs. 4 and 5.