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# Direct carrier multiplication due to inverse Auger scattering in CdSe quantum dots

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# Direct carrier multiplication due to inverse Auger scattering in CdSe

used in the calculation of the decay rates are computed with the semi-empirical nonlocal pseudopotential method described in Refs. 17 and 20, solved within a plane-wave basis, including spin–orbit effects. Electron and hole levels are labeled with increasing and, respectively, decreasing energy as $e_i$ and $h_j$, with $i,j=1,2,...$, where $e_1=e_{\mathrm{cbm}}$ and $h_1=h_{\mathrm{vbm}}$

energy levels above threshold. The AC lifetimes are obtained by summing over 30 deep hole final states $\{h_n\}$, whose energy is centered around $\epsilon_{h_1} - E_g$.

*Bulk versus dot*. We find (insets in Figs. 2 and 3) that the