

Supporting Information

Electroabsorption Spectra of Quantum Dots of PbS and Analysis by the Integral Method

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The results of the integral method analysis of the E-A spectra of PbS QDs having a diameter of 2.5, 3.0, 3.5 and 4.0 nm, respectively, are shown in Figures S1-S4 of the supporting information.

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Figure S1. The results of the analysis with the integral method for 2.5 nm diameter PbS QDs in a PMMA film. (A) Absorption spectrum (shaded line), and G1 and G2 bands having the Gaussian profile and the remaining. (B) The first integral of the E-A spectrum (thick black solid line), simulated spectrum (thick red solid line), and the following spectra contributed to the simulated spectrum: the first derivative of G1 (red dotted line), the first integral of G2 (green solid line), the first derivative of G2 (green dotted line), X1 band (thick black dotted line) and X2 band (thick blue dotted line). (C) The second integral of the E-A spectrum (thick black solid line), simulated spectrum (thick red solid line), and the following spectra contributed to the simulated spectrum: G1 band (red dotted line), the second integral of G2 (green solid line), G2 band (green dotted line), the first integral of X1 (thick black dotted line), and the first integral of X2 bands (thick blue dotted line). (D) E-A spectrum (shaded line) at a field strength of 0.5 MVcm^{-1} and the simulated spectrum (dotted line) derived by the integral method analysis.

Figure S2. The results of the analysis with the integral method for 3.0 nm diameter PbS QDs in a PMMA film. (A) Absorption spectrum (shaded line), and G1 and G2 bands having the Gaussian profile and the remaining. (B) The first integral of the E-A spectrum (thick black solid line), simulated spectrum (thick red solid line), and the following spectra contributed to the simulated spectrum: the first derivative of G1 (red dotted line), the first integral of G2 (green solid line), G2 band (green broken line), the first derivative of G2 (green dotted line), X1 band (thick black dotted line) and X2 band (thick blue dotted line). (C) The second integral of the E-A spectrum (thick black solid line), simulated spectrum (thick red solid line), and the following spectra

contributed to the simulated spectrum: G1 band (red dotted line), the second integral of G2 (green solid line), the first integral of G2 (green broken line), G2 band (green dotted line), the first integral of X1 (thick black dotted line), and the first integral of X2 bands (thick blue dotted line). (D) E-A spectrum (shaded line) at a field strength of 0.5 MVcm^{-1} and the simulated spectrum (dotted line) derived by the integral method analysis.

Figure S3. The results of the analysis with the integral method for 3.5 nm diameter PbS QDs in a PMMA film. (A) Absorption spectrum (shaded line), and G1 and G2 bands having the Gaussian profile and the remaining. (B) The first integral of the E-A spectrum (thick black solid line), simulated spectrum (thick red solid line), and the following spectra contributed to the simulated spectrum: the first derivative of G1 (red dotted line), the first integral of G2 (green solid line), the first derivative of G2 (green dotted line), X1 band (thick black dotted line) and X2 band (thick blue dotted line). (C) The second integral of the E-A spectrum (thick black solid line), simulated spectrum (thick red solid line), and the following spectra contributed to the simulated spectrum: G1 band (red dotted line), the second integral of G2 (green solid line), G2 band (green dotted line), the first integral of X1 (thick black dotted line), and the first integral of X2 bands (thick blue dotted line). (D) E-A spectrum (shaded line) at a field strength of 0.5 MVcm^{-1} and the simulated spectrum (dotted line) derived by the integral method analysis.

Figure S4. The results of the analysis with the integral method for 4.0 nm diameter PbS QDs in a PMMA film. (A) Absorption spectrum (shaded line), and G1 and G2 bands having the Gaussian profile and the remaining. (B) The first integral of the E-A

spectrum (thick black solid line), simulated spectrum (thick red solid line), and the following spectra contributed to the simulated spectrum: the first derivative of G1 (red dotted line), the first integral of G2 (green solid line), G2 band (green broken line), the first derivative of G2 (green dotted line), X1 band (thick black dotted line) and X2 band (thick blue dotted line). (C) The second integral of the E-A spectrum (thick black solid line), simulated spectrum (thick red solid line), and the following spectra contributed to the simulated spectrum: G1 band (red dotted line), the second integral of G2 (green solid line), the first integral of G2 (green broken line), G2 band (green dotted line), the first integral of X1 (thick black dotted line), and the first integral of X2 bands (thick blue dotted line). (D) E-A spectrum (shaded line) at a field strength of 0.5 MVcm^{-1} and the simulated spectrum (dotted line) derived by the integral method analysis.

Figure S1

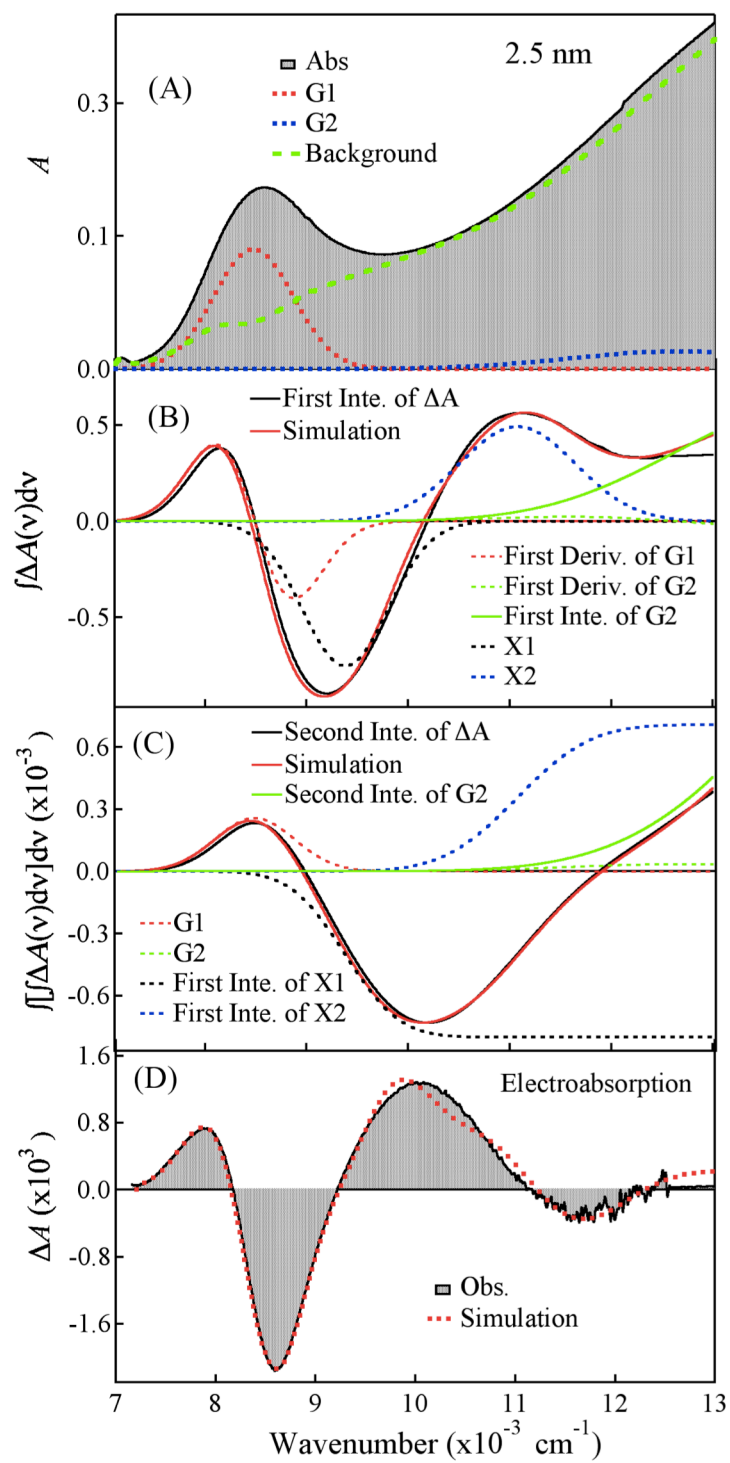


Figure S2

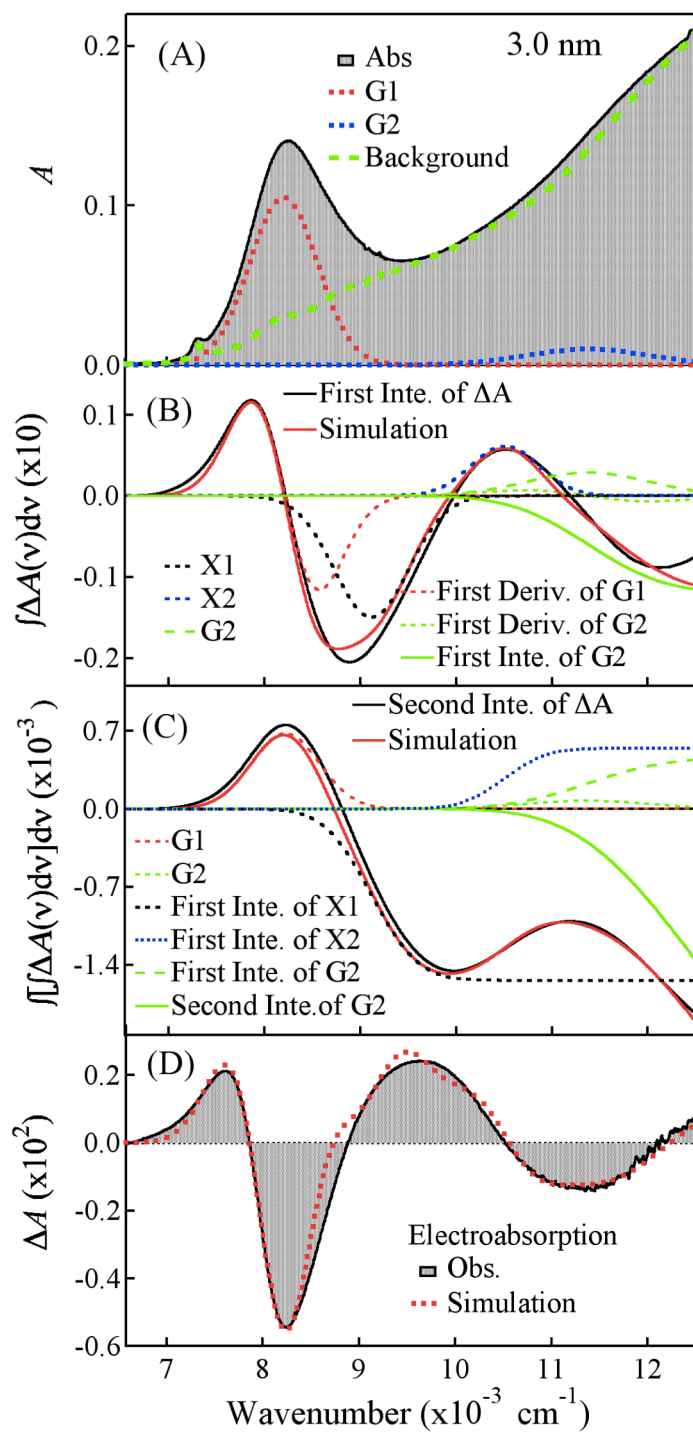


Figure S3

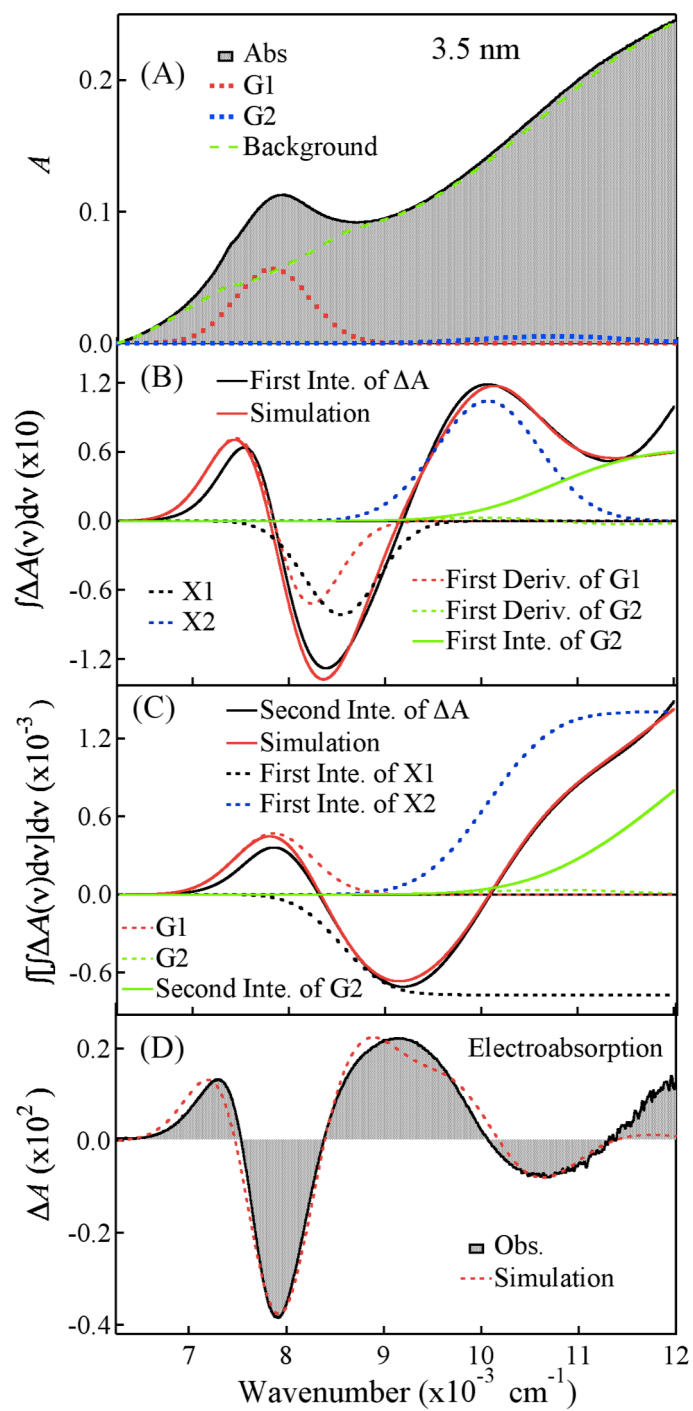


Figure S4

