ADVANCED OPTICAL MATERIALS

Supporting Information

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Combining Positive and Negative Dichroic Fluorophores for Advanced Light Management in Luminescent Solar Concentrators

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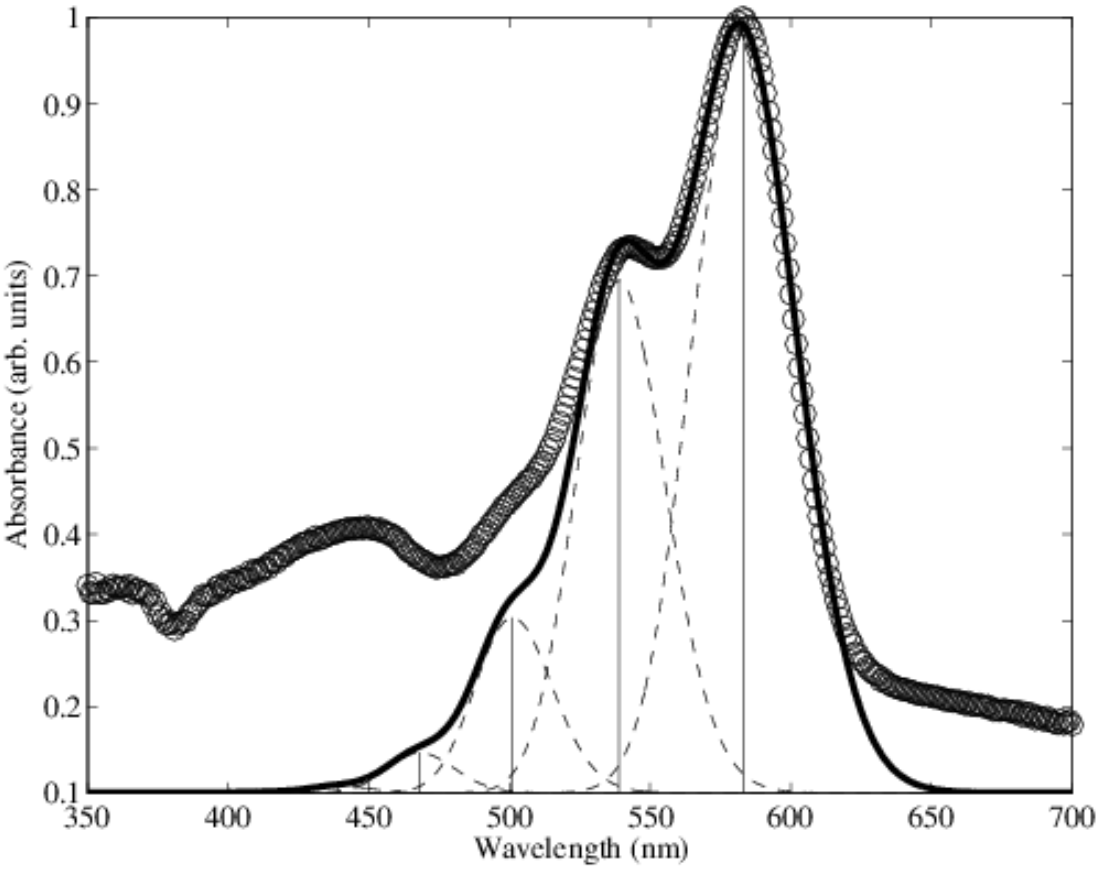

Figure S1. Gaussian peak fitting with curves of the form

$$I(E) = I_0(E_0)\exp\left[-\frac{(E_0 - n\Delta E)^2}{2\sigma^2}\right]$$

applied to the absorption spectrum of the 1.4 wt % Red305 sample. The normalized measured absorbance (circles), individual Gaussian peaks (dashed lines), individual Gaussian peak amplitudes (thin solid lines) and the total calculated absorbance profile (thick solid line) are plotted. The Huang-Rhys parameter (S = 0.68), ν_{0-0} transition central wavelength

($E_0 =$ 580 nm, 2.13 eV), vibrational transition energy (ΔE = 170 meV) and peak width (σ = 68 meV) were determined by fitting the first two peaks in the absorption spectrum plotted as a function of photon energy. The rest of the progression was then calculated using these parameters. Figure S1 shows that the expected absorption dipole moment attributed to this state at 450 nm is small; therefore any detected photoluminescence is unlikely to arise from direct population of this state when excitation is performed at 450 nm.

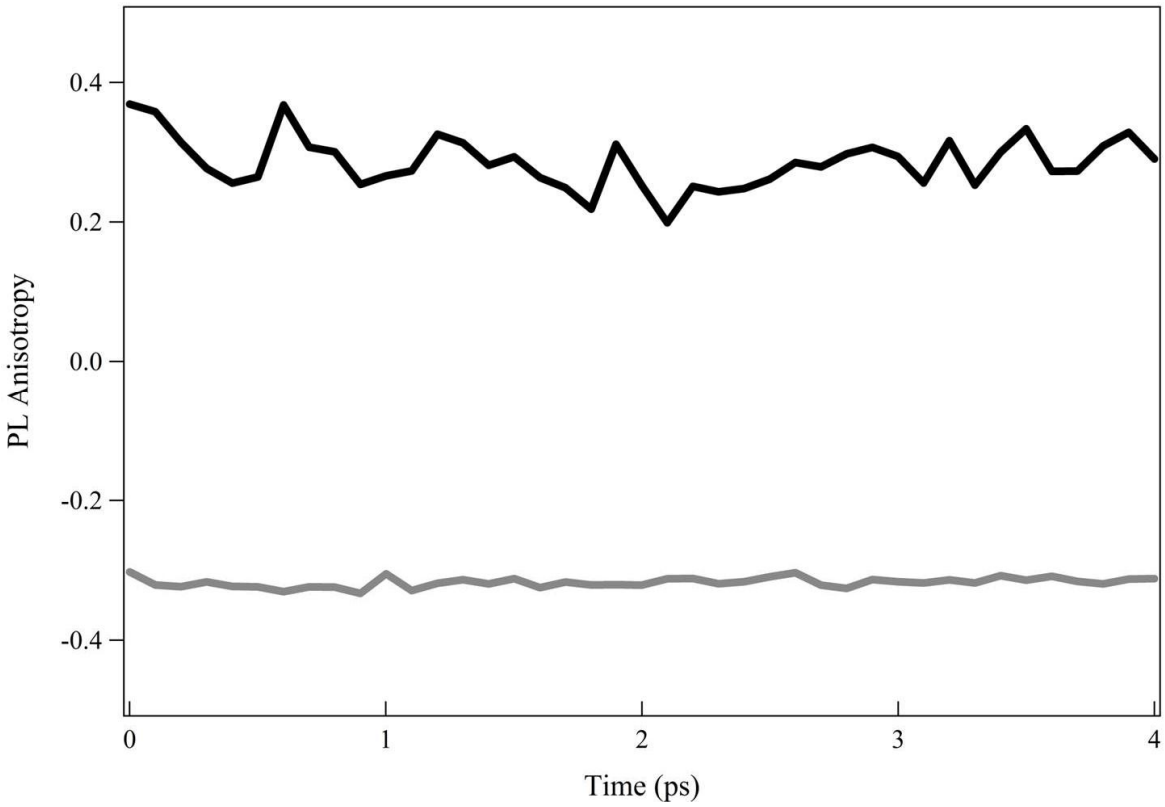

Figure S2. PL anisotropy for 1.4% Red305 in polymerized LC host exposed to light polarized patrallel (gray) and prependicular (black) to the alignment direction of the LCs. The samples were excited at 450 nm with 10 mW average power detected at 364 nm (corresponding to up-converted 648 nm emission). Data resulted in R_e^{par} = -0.30 and R_e^{per} = 0.29.

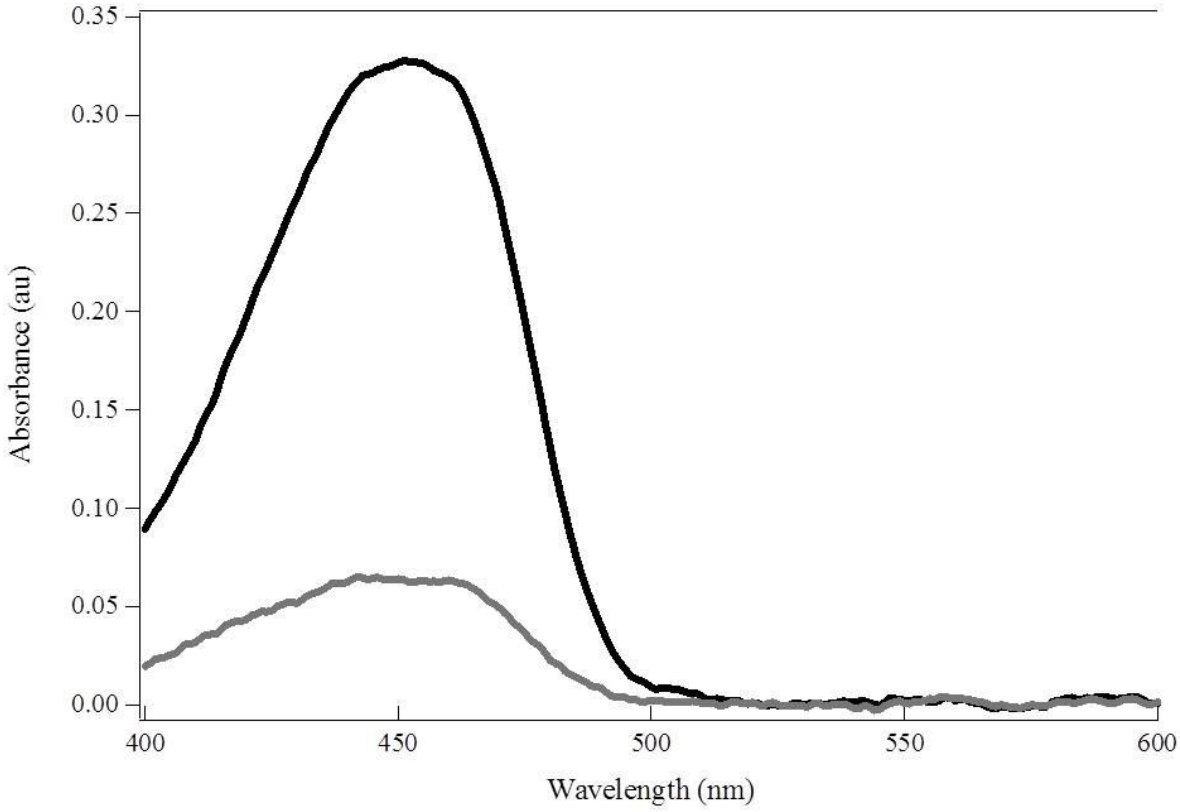

Figure S3. Absorbance spectra of coumarin derivative aligned in polymerized LC host on PMMA exposed to light polarized parallel (black) and perpendicular (gray) to the alignment direction of the LC host.