

Supporting Information

Electrothermal and water dual-modal-responsive flexible Polydiacetylene chiroptical films for multiplex laser display

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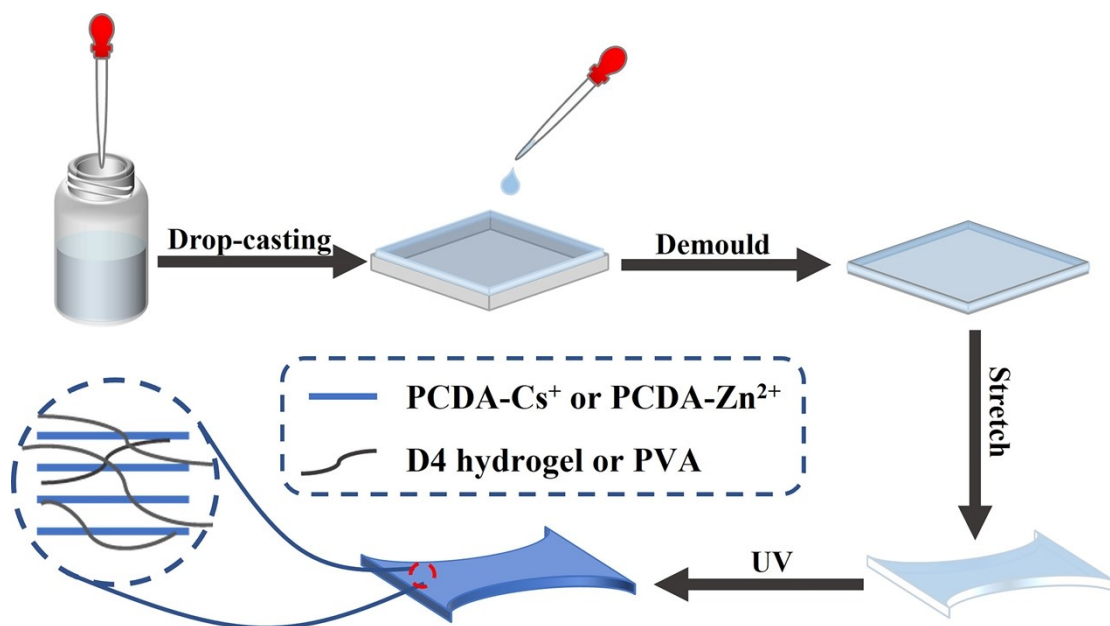


Fig. S1 The fabrication process of PCDA-Cs⁺/D4 hybrid film and PDA-Zn²⁺/PVA hybrid film.

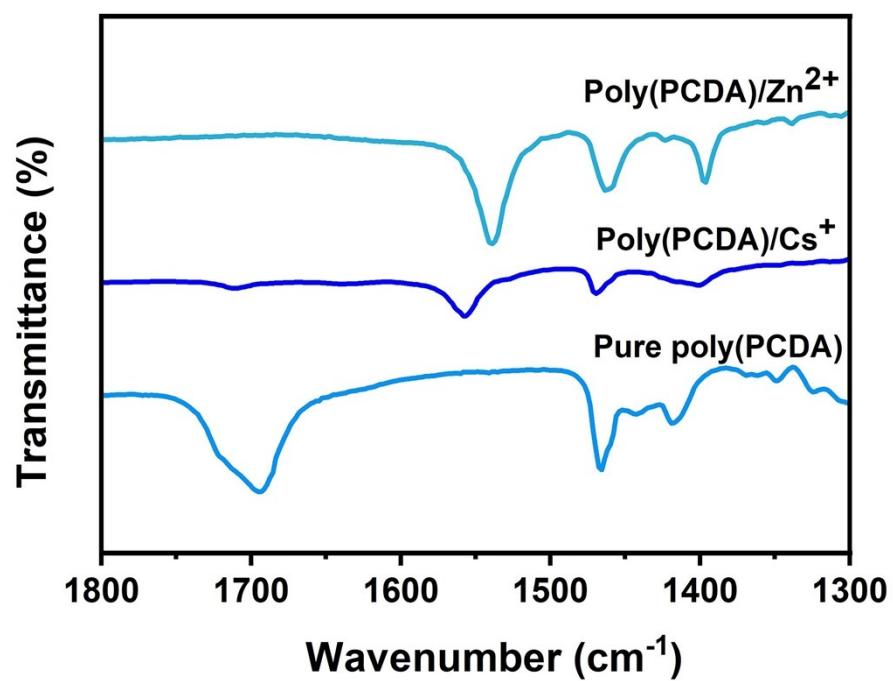


Fig. S2 FT-IR spectrum characterization of Pure poly (PCDA), poly (PCDA)/Cs⁺ and poly (PCDA)/Zn²⁺.

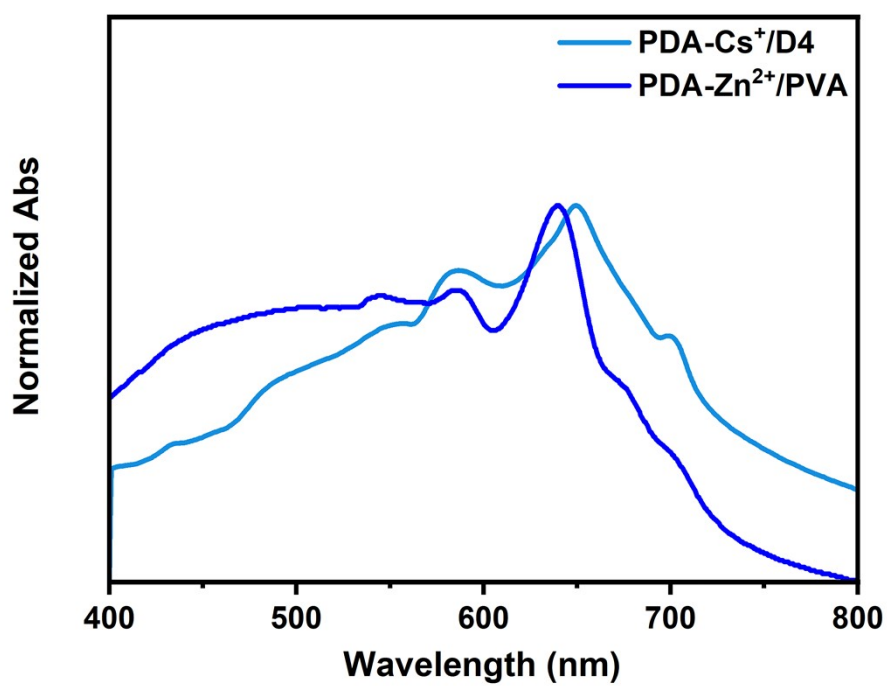


Fig. S3 UV-vis spectra of PDA-Cs⁺/D4 hybrid film and PDA-Zn²⁺/PVA hybrid film.

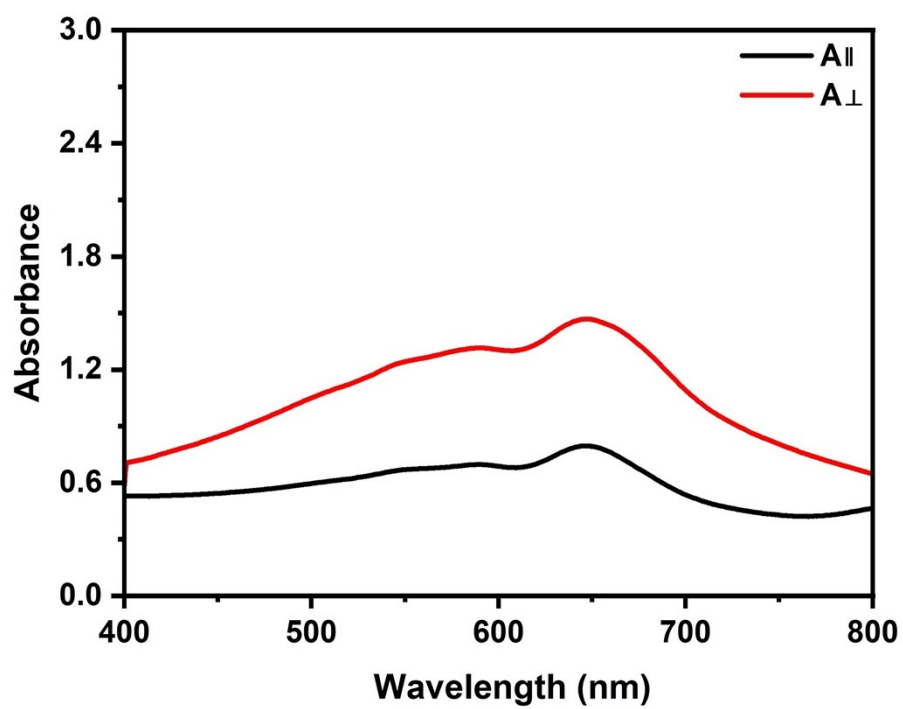


Fig. S4 Polarized UV-vis absorption spectra of PDA-Cs⁺/D4 hybrid film.

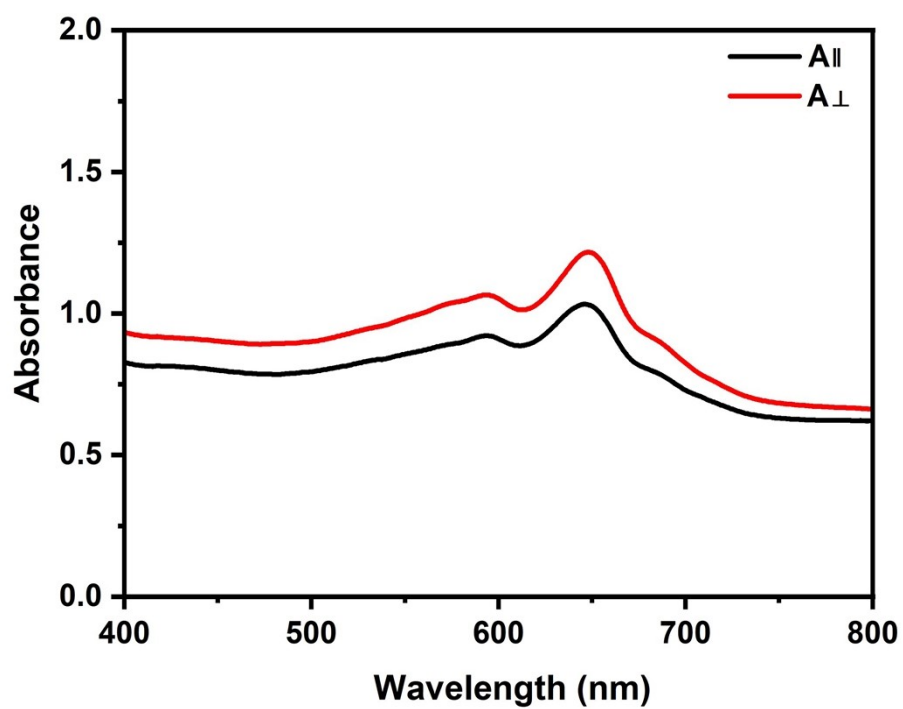


Fig. S5 Polarized UV-vis absorption spectra of PDA-Zn²⁺/PVA hybrid film

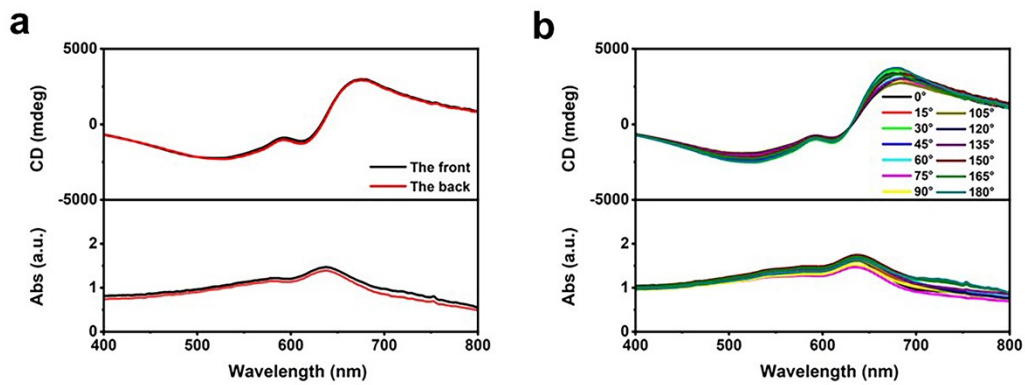


Fig. S6 (a) CD and absorption spectra of PDA-Cs⁺/D4 TSL films upon flipping. (b) CD and absorption spectra of PDA-Cs⁺/D4 TSL films at various rotation angles ranging from 0° to 180°.

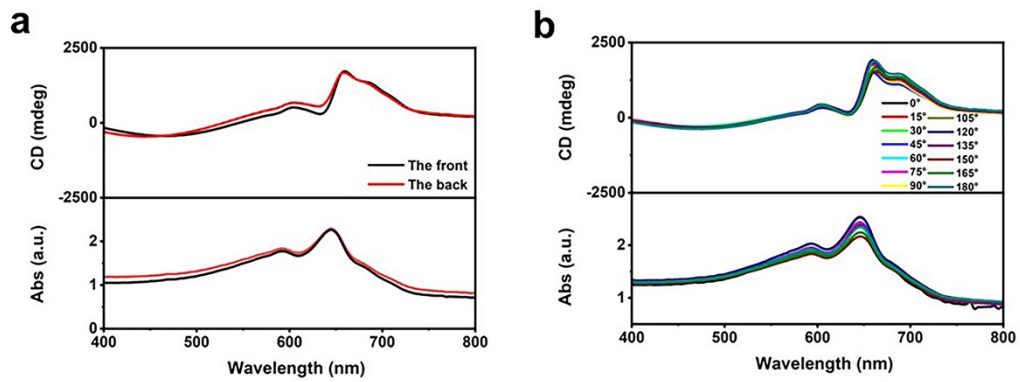


Fig. S7 (a) CD and absorption spectra of PDA-Zn²⁺/PVA TSL films upon flipping. (b) CD and absorption spectra of PDA-Zn²⁺/PVA TSL films at various rotation angles ranging from 0° to 180°.

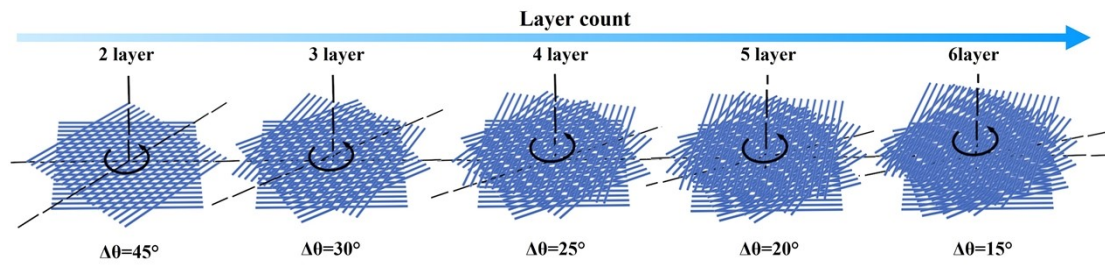


Fig. S8 Schematic illustration of multilayer stacked structure.

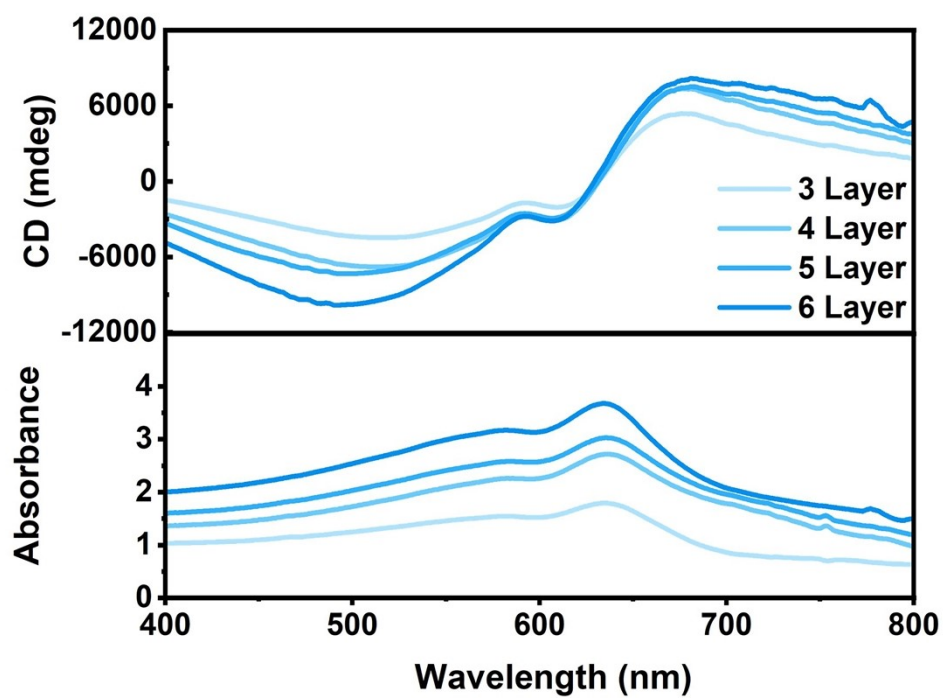


Fig. S9 The change of CD and absorption with the number of stacking layers.

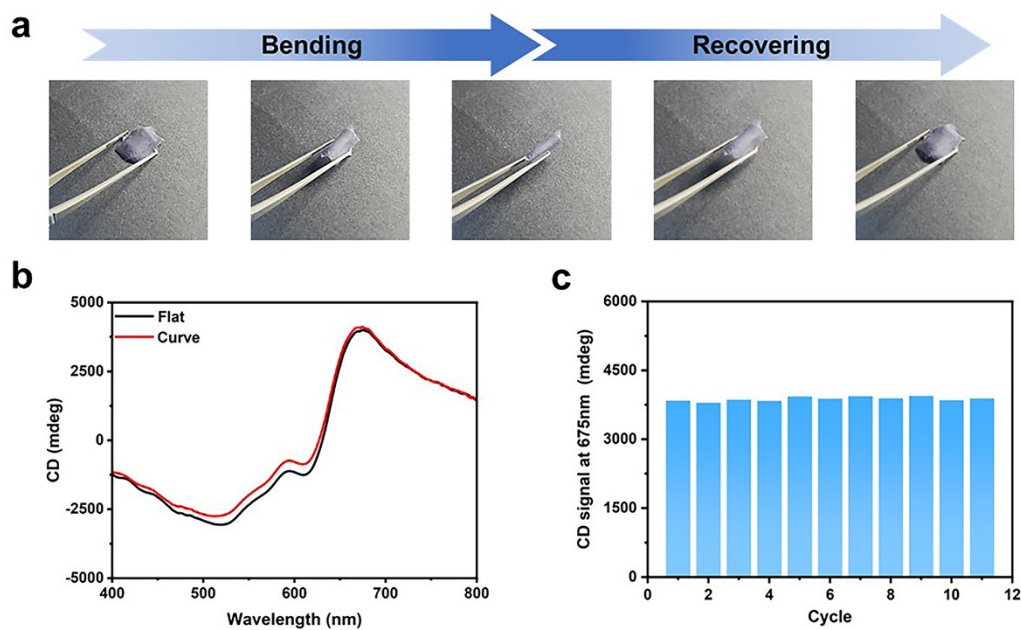


Fig. S10 (a) Illustration of the deformation and recovering behavior of the PDA-Cs⁺/D4 hybrid films. (b) The CD spectra of the hybrid films upon bending and recovering. (c) The variation of the CD intensity at 675 nm upon the cycles of bending and recovering operations.

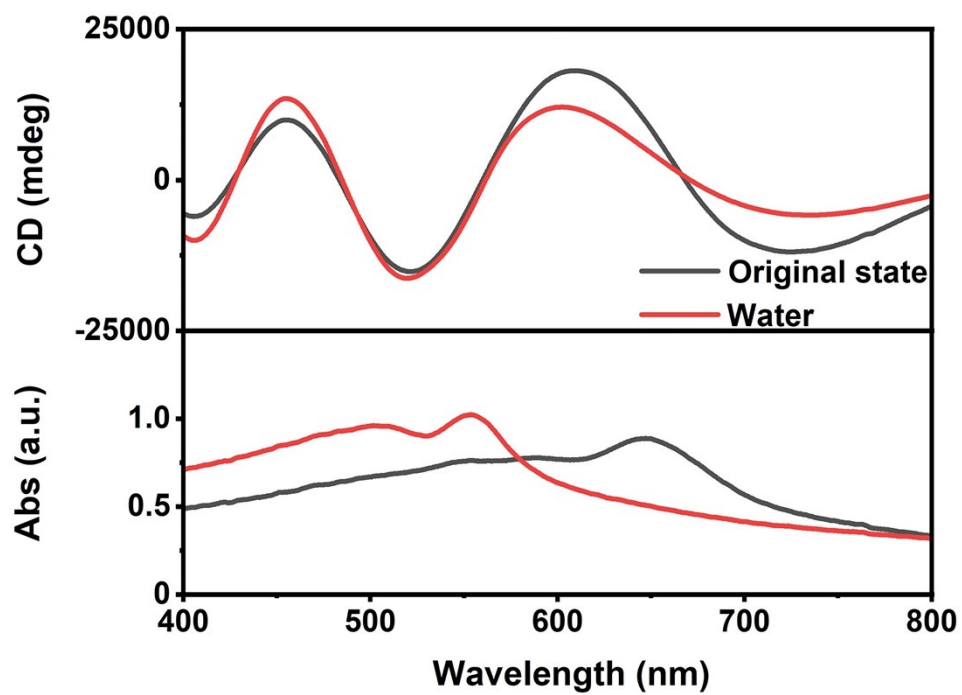


Fig. S11 CD and absorption spectra of the experimental PDA-Cs⁺/D4 films for circular polarization-based multiplex laser display.

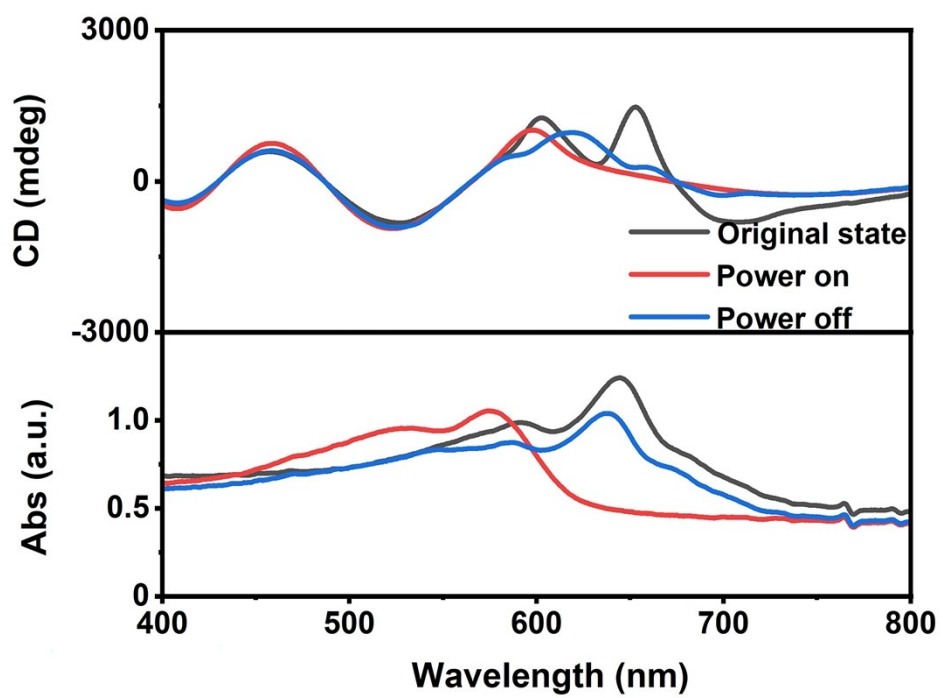


Fig. S12 CD and absorption spectra of the experimental PDA-Zn²⁺/PVA films for circular polarization-based multiplex laser display.

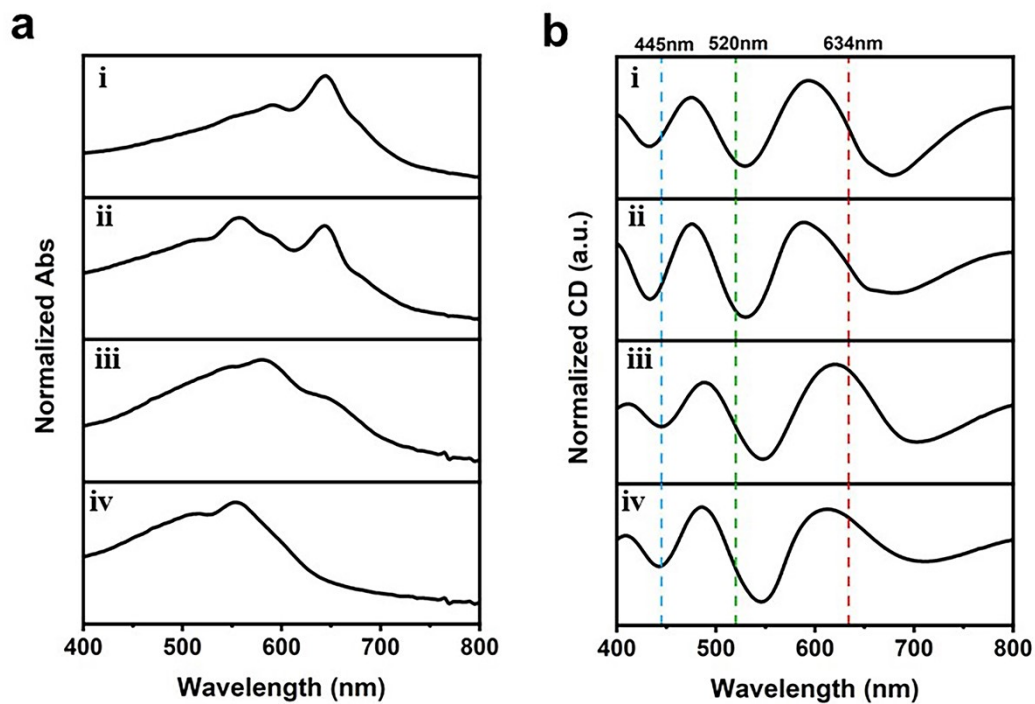


Fig. S13 CD and absorption spectra of the experimental multi-stimuli response films for circular polarization-based multiplex laser display.

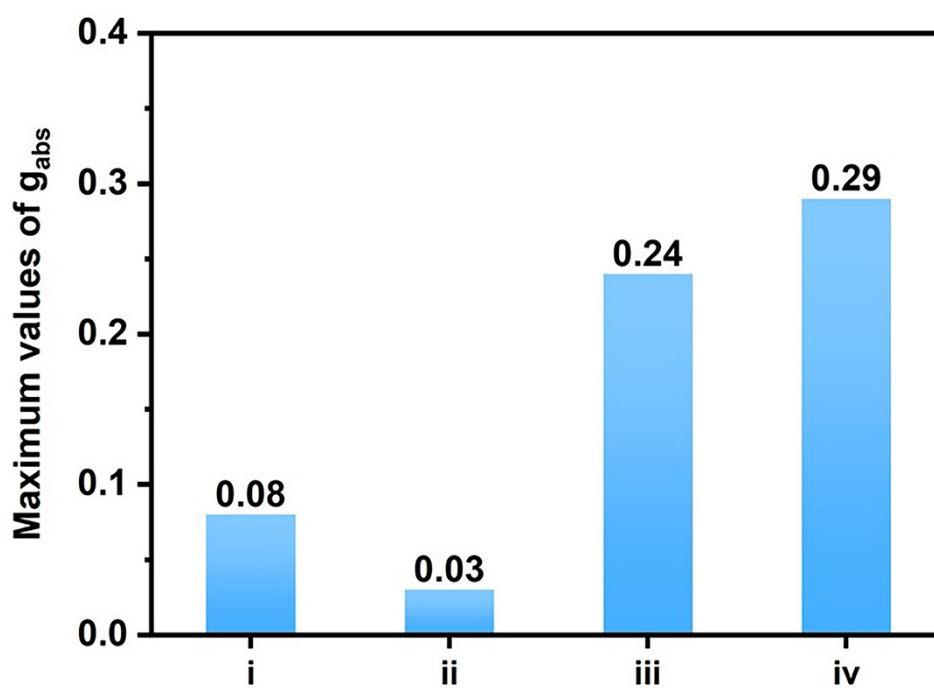


Fig. S14 The maximum values of the dissymmetry factors (g_{abs}) for CD spectra of the four kinds of TSL films: (i) homogeneous PDA-Cs⁺/D4 TSL films; (ii) homogeneous PDA-Zn²⁺/PVA TSL films; (iii) heterogeneous PDA-Zn²⁺/PVA @ PDA-Cs⁺/D4 TSL films; (iv) The hybrid PVA@ PDA-Zn²⁺/PVA @ PDA-Cs⁺/D4 TSL films.

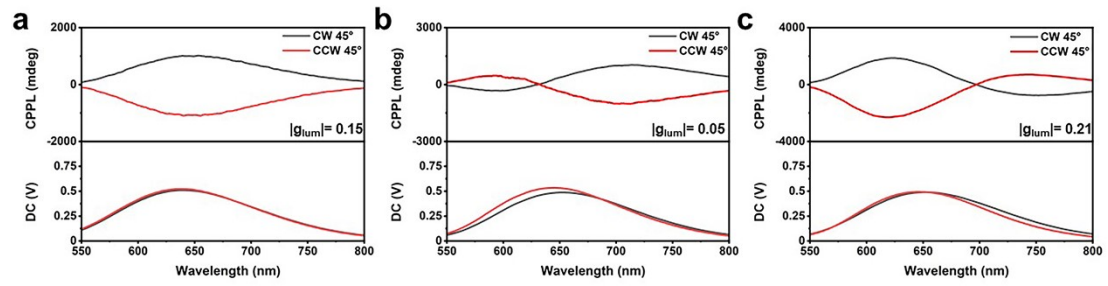


Fig. S15 Circularly polarized photoluminescence (CPPL) of the red-phase TSL films. (a) homogeneous PDA-Cs⁺/D4 TSL films. (b) heterogeneous PDA-Cs⁺/D4@PDA-Zn²⁺/PVA TSL films. (c) The hybrid PVA@PDA-Zn²⁺/PVA@PDA-Cs⁺/D4 TSL films.