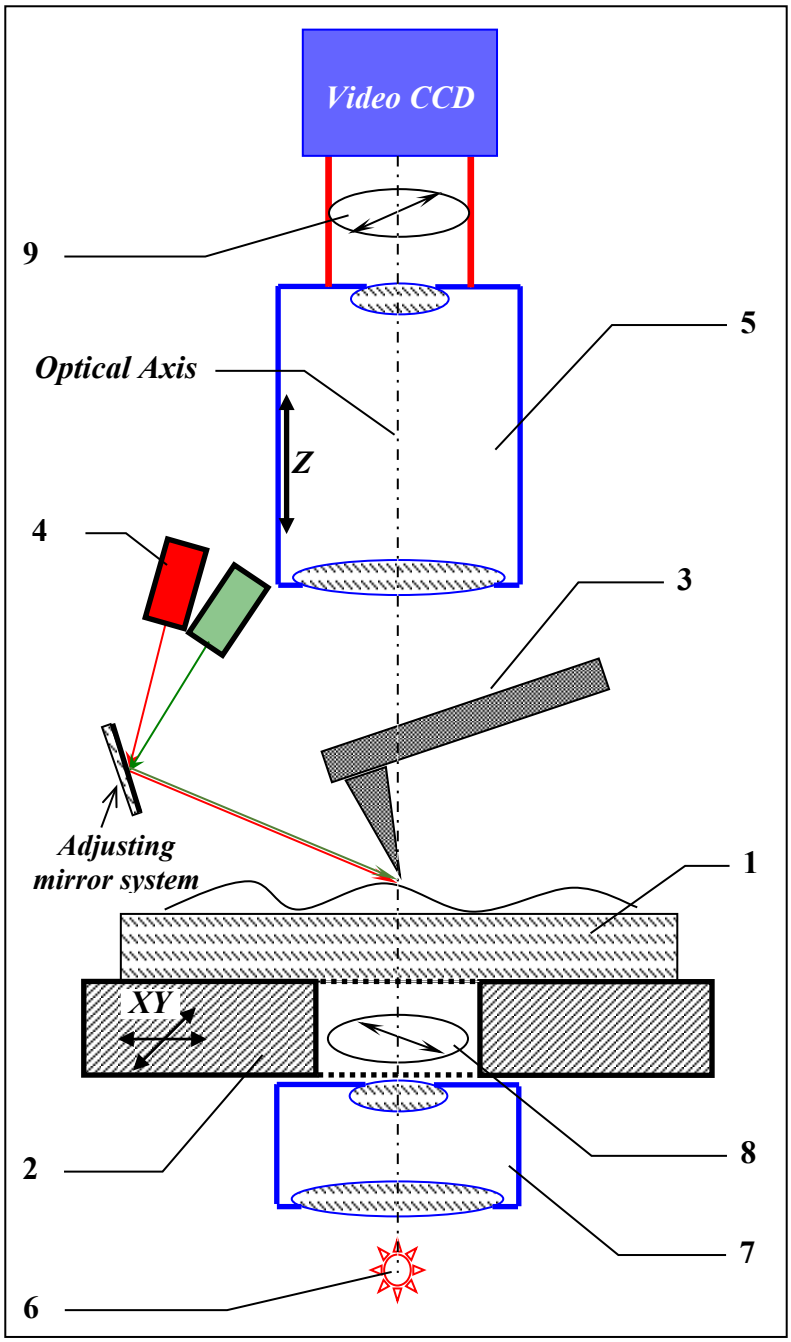
Electronic Supplementary Material (ESI) for Soft Matter.

Supporting information

Laser-induced “craters” and “hills” formation in the azobenzene containing polymethacrylates films.



Scheme S1. Experimental setup used for simultaneous AFM and POM measurements. (For explanations, see the Experimental part.) **1** - sample; **2** - XY- piezostage; **3** - AFM-head; **4** - Green and red lasers; **5** - upright microscope; **6** - light source; **7** - condenser lens system; **8** - polarizer; **9** - analyzer.

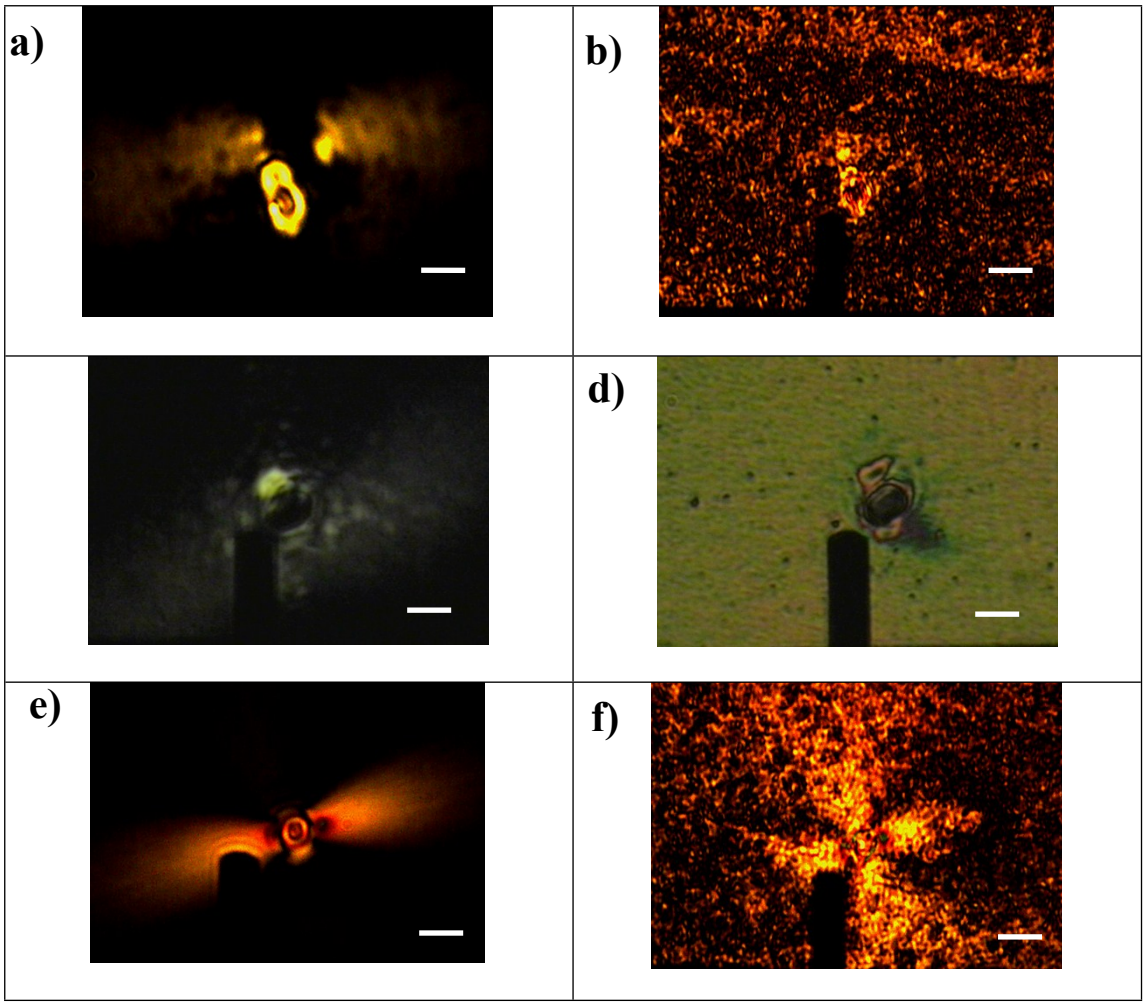


Fig. S1. POM image of the irradiated quenched (a) and annealed (b) films of **PMDA 6/10**; quenched (c) and annealed (d) films of **PMDA 10/6** (b); green laser, 532 nm (~80 μW, 30 s). POM image quenched (e) and annealed (f) films of **PMDA 6/10** film after red laser action (633 nm, ~80 μW, 20 min). Scale bar is 30 μm.

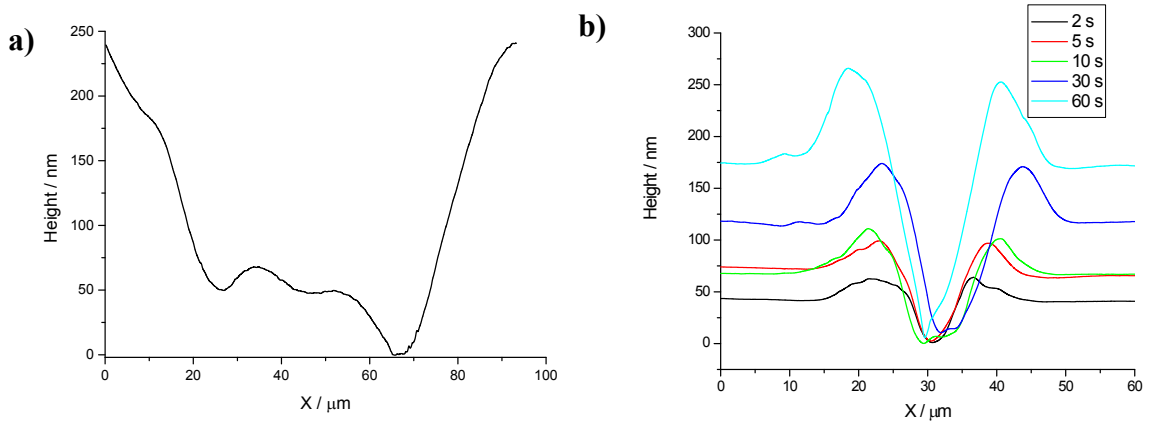


Fig. S2. Cross-sections in direction of light polarization of *quenched* **PMDA 6/10** film after green laser irradiation with low intensity (0.8 μW, 30 min) (a) and for *annealed* LC film of **PMDA 6/10** film irradiated by green laser (80 μW) during different time (b).

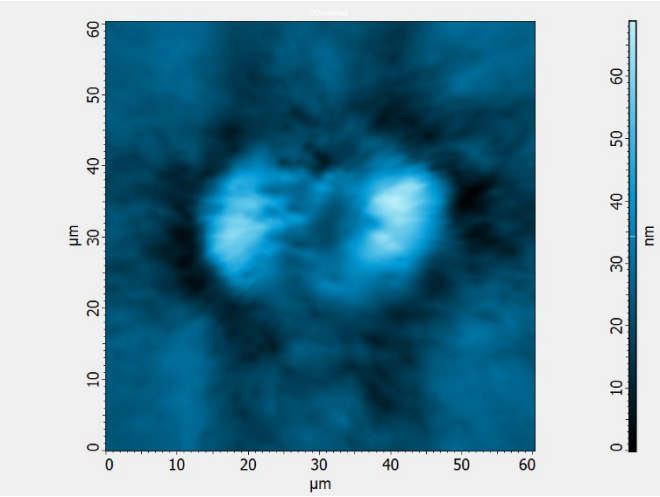


Fig. S3. AFM image of the *annealed* LC **PMDA 6/10** polymethacrylate film after 20 min of red laser (633 nm) irradiation (~80 µW).

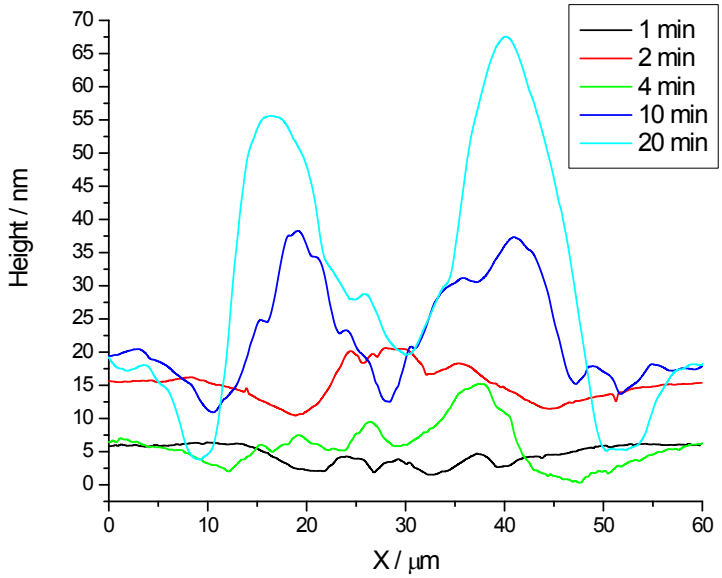


Fig. S4. Cross-sections in direction along polarization plane of *annealed LC* **PMDA 6/10** polymethacrylate film irradiated by red laser light.

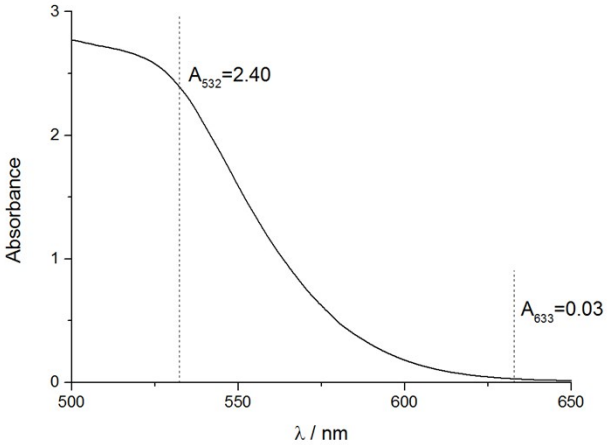


Fig. S5. Absorbance spectra of thick amorphousized film (~20 μm) of **PMDA 6/10** polymethacrylate in long-wavelength range.

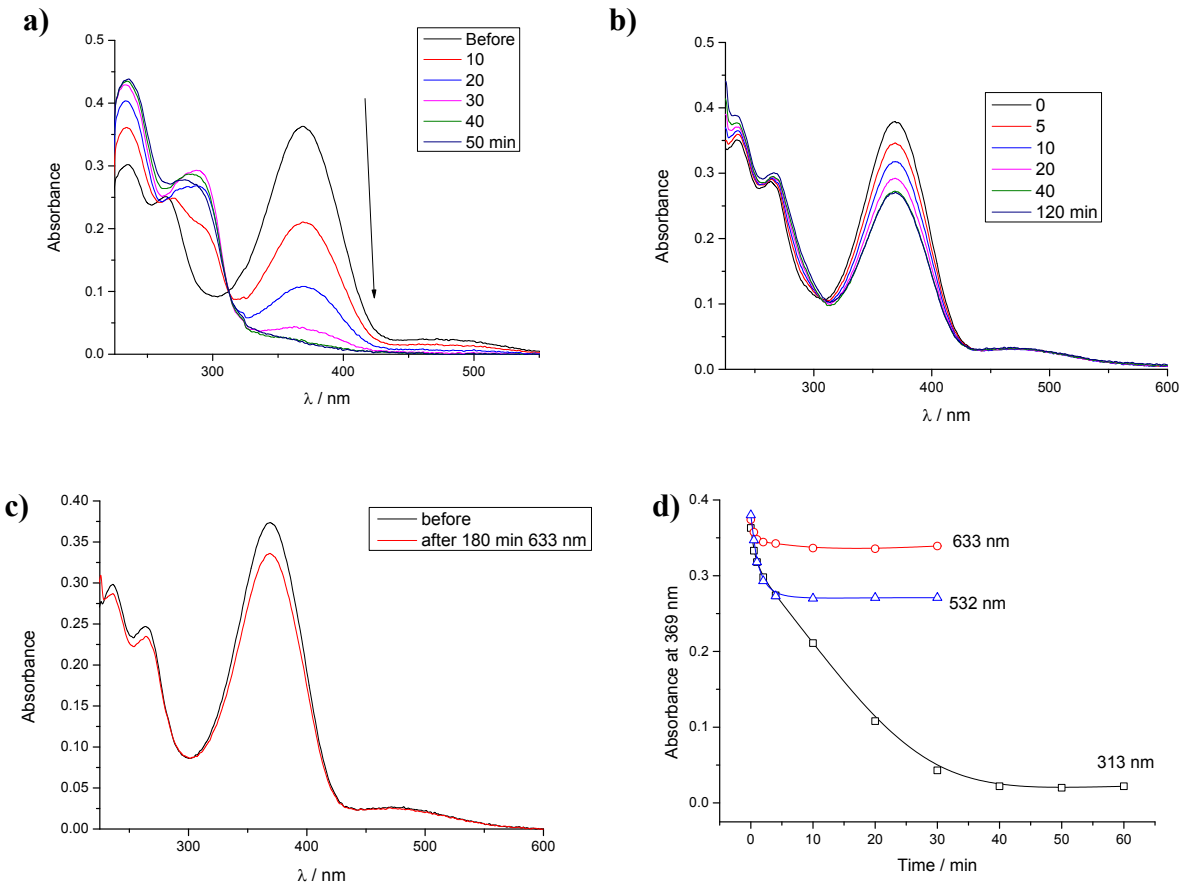


Fig. S6. Absorbance spectra changes under irradiation of the **PMDA 6/10** solution in dichloroethane (~0.01 mg/mL) under light action with different wavelengths: 313 nm (1.8 mW/cm^2) (a), 532 nm (0.8 mW/cm^2) (b) and 633 nm (2.4 mW/cm^2) (c). (d) Kinetics of the absorbance decrease.

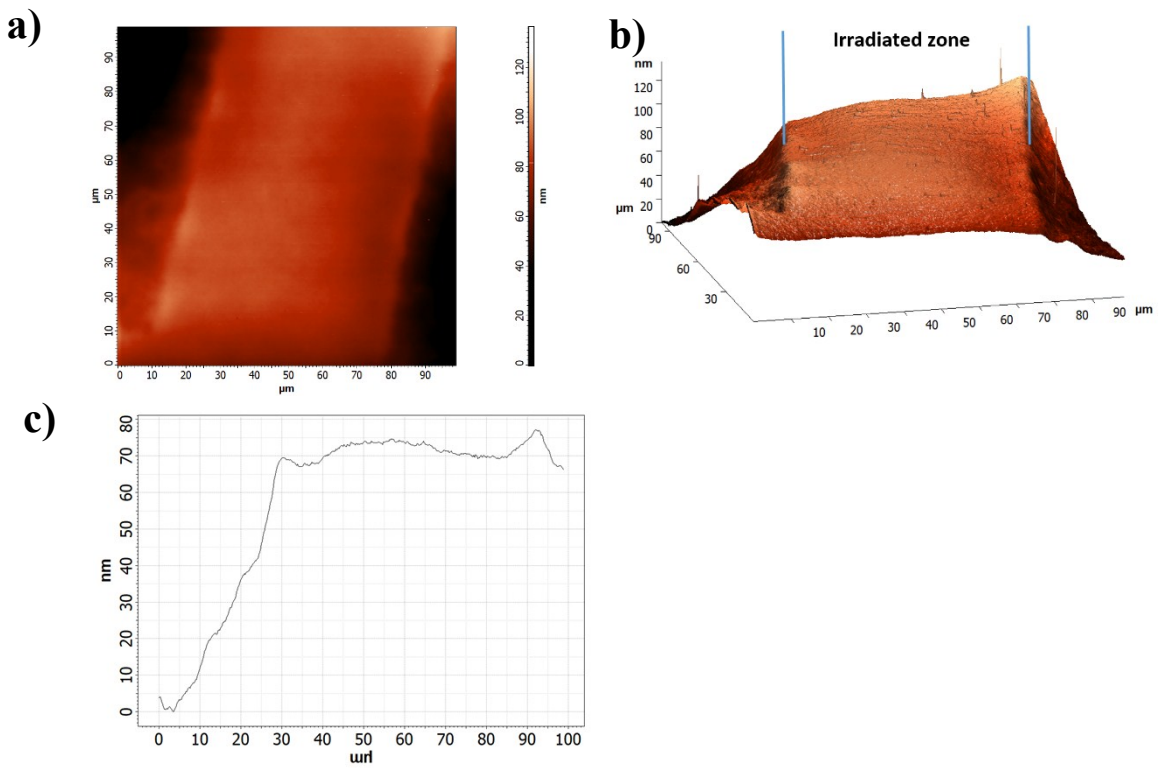


Fig. S7. (a) 2D and (b) 3D AFM scans of **PMDA 6/10** polymethacrylate film irradiated with UV-light (1 hour, 375 nm, ~5 mW/cm^2) through the mask followed by annealing at 40^{o}C overnight. Line with width of 50 µm corresponds to the irradiated zone. (c) Corresponding cross-section of the AFM scan in horizontal direction.