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Orientations of Chromonic Liquid Crystals by Imprinted or Rubbed Polymer Films[1] YOUNGWOO YI, Department of Physics and Liquid Crystal Materials Research Center, University of Colorado, Boulder, CO 80309, USA, AYA MCGUIRE, Department of Physics, Reed College, Portland, OR 97202, USA, NOEL CLARK, Department of Physics and Liquid Crystal Materials Research Center, University of Colorado, Boulder, CO 80309, USA — A variety of novel alignment effects of chromonic liquid crystal phases of sunset yellow (SSY)/water, disodium cromoglycate (DSCG)/water, and their mixtures by thiol-ene polymer films topographically imprinted with linear channels are observed using polarizing optical microscopy. Nematic DSCG and SSY at low concentration and their nematic mixtures orient with the long axes of stacked chromonic aggregates on average parallel to the channels, that is, with the molecular planes normal to the channel axis. On the contrary, nematic SSY in contact with the rubbed polyimide films orients with the long axes on average in-plane perpendicular to the rubbing direction, arguably, due to a tongue-groove interaction between SSY and the stretched PI chains. Furthermore, multi-stable alignments are observed in SSY solutions of sufficiently high concentration, including preferential in-plane orientation of the long axes of the aggregates parallel to, perpendicular to, and 45° rotated from the channels.

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