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Excitation-Enhanced Optical Reorientation in Pure Liquid Crystalline Materials THAI V. TRUONG, YUEN-RON SHEN, Department of Physics, University of California, Berkeley — Electronic excitation with polarized light necessarily creates complementary orientational anisotropies from the excited and ground-state molecules. If the intermolecular interaction with the surrounding experienced by the excited-state molecules is different from that experienced by the ground-state molecules, a net excitation-induced orientational anisotropy will develop, enhancing the molecular reorientation provided directly by the optical field. This effect is analogous to that observed in dye-doped liquid crystals (LC) when dye molecules are excited. We report here the study of the effect in a pure isotropic LC medium. We use an optical pump-probe method to observe the excitation-induced reorientational dynamics. As the system relaxes back from picosecond pulse excitation, an increase in the orientational anisotropy of the ground-state molecules is observed, signifying the enhanced optical reorientation due to the state-dependent intermolecular interaction. The observed dynamics is well predicted by a mean-field model describing the intermolecular interaction between LC molecules. This work was supported by NSF

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