

Study of the dynamic formation of transmission gratings recorded in photopolymers and holographic polymer-dispersed liquid crystals

Sébastien Massenot, Jean-Luc Kaiser, Raymond Chevallier, and Yvon Renotte

- **Applied Optics**
- Vol. 43,
- [Issue 29](#),
- pp. 5489-5497
- (2004)
- <https://doi.org/10.1364/AO.43.005489>

Abstract

Local and nonlocal models for the diffusion of photopolymers are applied to the dynamic formation of transmission gratings recorded in photopolymers and holographic polymer-dispersed liquid crystals (H-PDLCs). We retrieve the main parameters of H-PDLCs (refractive-index modulation and diffusion coefficient) by combining a solution of the one-dimensional diffusion equation and the rigorous coupled-wave theory applied to transmission gratings. The rigorous coupled-wave theory method provides us with information on higher harmonics of the refractive profile (not only on the first harmonic as when the classical Kogelnik theory is applied). Measurements concerning the second harmonic validate the modeling.

© 2004 Optical Society of America