

Optical Action in Complex Media

Aristide Dogariu, Sergey Sukhov, and Kyle M. Douglass

CREOL, The College of Optics and Photonics, University of Central Florida, Orlando, FL, USA
adogariu@creol.ucf.edu

Abstract

The interaction between light and complex material systems can be controlled by manipulating the coherence and polarization properties of electromagnetic fields. Harnessing light at scales comparable with the wavelength offers distinctive possibilities not only for sensing material or radiation properties [1-3] but also for controlling the mechanical action induced by light [4-6]. At such dimensions, photonic phenomena include scale-specific modifications of the structure so that a passive interpretation of the reciprocal action is inadequate and a description including dynamics of the light-medium interaction is necessary [7]. We will review both passive and active applications where the continuous reconfiguration of the electromagnetic field in space and time leads to unique nonequilibrium dynamics.

References

- [1] E. Baleine and A. Dogariu, Phys. Rev. Lett. **95**, 193904 (2005).
- [2] J. Ellis and A. Dogariu, Phys. Rev. Lett. **95**, 203905 (2005).
- [3] X. Lu, *et al.*, Nat. Commun. **3**, 998 (2012).
- [4] D. Haefner, S. Sukhov, and A. Dogariu, Phys. Rev. Lett. **103**, 173602 (2009).
- [5] M. Juan, M. Righini, and R. Quidant, Nat. Photon. **5**, 349 (2011).
- [6] S. Sukhov and A. Dogariu, Phys. Rev. Lett. **107**, 203602 (2011).
- [7] K.M. Douglass, S. Sukhov, and A. Dogariu, Nat. Photon. **6**, 834 (2012).