

Abstract

Liquid Crystal Infiltrated Random Media: From the Optical NTC-Resistor to Temperature Tunable Random Lasers

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We will discuss experiments on various disordered dielectric systems that are infiltrated with liquid crystals. An example of such a material is liquid crystal infiltrated macro porous glass. The diffusion of light in such a system depends strongly on temperature, which allows to tune the diffusion constant of a single sample. This is a new feature in multiple light scattering studies and opens up interesting possibilities. For instance, it allows to create a random laser with a laser threshold that depends on temperature. This tunable random laser was realized by introducing optical amplification in a liquid crystal infiltrated sintered glass. It represents a new type of light source with an emission spectrum that can be controlled via environment temperature and switched via an external electric field. [See also: wiersma et al., Nature 414, 708 (2001).]

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