

Abstract

Random Lasing and Random Resonators in Disordered Dielectric Film ¹

V. M. APALKOV^{¶1}, M. E. RAIKH¹, and B. SHAPIRO²

¹Department of Physics
University of Utah
Salt Lake City, UT 84112
USA

²Technion-Israel Institute of Technology

apalkov@physics.utah.edu

Received: Wed, 10 Apr 2002 12:32:19

A real density of disorder-induced resonators with a high quality factor, $Q \gg 1$, in a film with fluctuating refraction index is calculated theoretically. We demonstrate that for a given $kl > 1$, where k is the light wave vector, and l is the transport mean free path, when on average the light propagation is diffusive, the likelihood for finding a random resonator increases dramatically with increasing the size of the scatterers, or, more precisely, the correlation radius of the disorder. Parameters of most probable resonators as functions of Q and kl are found.

¹Work performed under the auspices of NSF under grant No. DMR-0202790 and Petroleum Research Fund under grant No. PRF 37890-AC6.

[¶]Presenter

Filename: Apalkov2

Last document update: Wed Jul 10 08:15:31 MDT 2002