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Autore	Mitra Kunal
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Sommario/riassunto	This book presents practical information on the clinical applications of short pulse laser systems and the techniques for optimizing these applications in a manner that will be relevant to a broad audience, including engineering and medical students as well as researchers, clinicians, and technicians. Short pulse laser systems are useful for both subsurface tissue imaging and laser induced thermal therapy (LITT), which hold great promise in cancer diagnostics and treatment. Such laser systems may be used alone or in combination with optically active nanoparticles specifically administered to the tissues of interest for enhanced contrast in imaging and precise heating during LITT.

Mathematical and computational models of short pulse laser-tissue interactions that consider the transient radiative transport equation coupled with a bio-heat equation considering the initial transients of laser heating were developed to analyze the laser-tissue interaction during imaging and therapy. Experiments were first performed to characterize the tissue optical properties needed to optimize the dose for thermal therapy. Experiments were then performed on animal models to characterize the heat affected zone for LITT. The experimental measurements were also validated using the computational models. .