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A. Kachanov

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Nonlinear dynamics of a multimode lasers. From intracavity spectroscopy to femtoseconds

A.A. KACHANOV

*Institute for Spectroscopy of the Russian Academy of Sciences
and Laboratoire de Spectrométrie Physique, Université Joseph Fourier Grenoble I, France*

The influence of a nonlinear mode coupling on the time evolution of generation spectrum of a broadband multimode lasers will be described. The results are applied to the creation of laser spectrometers capable of measuring very weak absorption spectra with quantum noise limited detection threshold. The prospects of using new solid-state laser mediae for the intracavity spectroscopy will be discussed.

A brief review of femtosecond systems for the study of transition states in chemical reactions will be done. (Ring CPM dye laser and self-mode-locked Ti:Sapphirebased laser/amplifier systems). Recent results with Cr⁴⁺:YAG infrared mode-locked laser tunable in the range from 1.35 to 1.6 μ will be described.