Laser Physics 464 — Homework 3

Due Wednesday, October 9, 2024

"Pot pourri" of parameters

Physical parameters

You are given the absorption cross section of a medium (σ) and the density. $\sigma = 5 \cdot 10^{-16}$ cm^2; $N = 5 \cdot 10^{18}$ cm^{-3}; $\lambda = 800$ nm. The phase relaxation time is $T_2 = 1$ ps. Find the spontaneous relaxation rate T_1, the saturation energy density, the saturation intensity, Rabi frequency coefficient, dipole moment, and the absorption coefficient.

Inhomogeneous broadening

Derive an expression for the saturated absorption.