

ANALYSIS OF THE INFLUENCE
OF THE FIELD BROADENING
ON TRANSITIONS IN A He–Ne LASER

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S u m m a r y

By using Einstein's coefficients, the field broadening of energy levels depending on the mode power and detuning is calculated for homogeneous and heterogeneous lines. It is shown that increasing the mode power results in the approximation of the shape of a Bennett dip by a rectangular one. Dispersion of the refraction index reacting on the gap shape changes the sign in the framework of the Bennett dip. Taking into account the mode interaction, the spectral dependence of output energy for every mode is calculated for collinear and orthogonal modes and compared with experimental results. A high level of field broadening changes the character of the active transition. The heterogeneous broadened line is transformed into a homogeneous one, which leads to inversion of the Lamb dip. The theoretical and experimental data for the red line ($\lambda = 633$ nm) of a He–Ne laser are compared with each other.