In describing the purely spectroscopic method [1, sect. B] of determining the amplification cross section of Nd^{3+}, the formula

$$\frac{\tau_{21}}{\tau_{20}} = \frac{I_{20}}{I_{21}} \tag{1}$$

was used. τ and I are the radiative lifetimes and integrated fluorescent intensities, respectively. The subscripts 21 and 20 refer to the 1.052 and 0.867 μm emissions, respectively.

Equation (1) relates the intensities and probabilities of transitions that share a common upper level. It is correct only if I is given in numbers of photons. If I is given in joules, watts, or other common intensity (energy) units the correct relationship is expressed by [2]

$$\frac{\tau_{21}}{\tau_{20}} \cdot \frac{\nu_{20}}{\nu_{21}} = \frac{I_{20}}{I_{21}} \tag{2}$$

where ν is the frequency. The reason is that the radiative lifetimes (reciprocial of the Einstein A coefficients) refer to the rate at which emitters leave an upper level in a given transition; but the energy (intensity) thus emitted depends on which of the lower levels (transitions) is involved.

In the case cited $\nu_{21}/\nu_{20} \simeq 0.824$, and it appears to us that this term should have been included in their equation (9). This would reduce their calculated value of τ_{21} from 700 to approximately 577 μs. Since σ_{21} was calculated from

$$\sigma_{21} = \frac{\lambda_0^2}{8\pi n^2 \Delta\nu} \frac{1}{\tau_{21}} \tag{3}$$

the cross section would be increased from 8.3×10^{-20} to approximately 10×10^{-20} cm^2. (A factor of c was incorrectly shown, but not used, in their equation 10.)

Their comparison of the Nd:glass cross section to the Nd:liquid cross section would not be significantly affected since it appears that a similar omission of the (ν_{21}/ν_{20}) factor was previously made by one of the authors in determining the Nd:glass cross section [3].

A similar type of correction should, we believe, be applied to the expression

$$\tau_t = \tau_{20} \frac{I_{20}}{I_t}, \tag{4}$$

which was used to estimate the quantum efficiency and total radiative decay time (τ_t).

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Correction to "Performance of an Unstable Oscillator on a 30-kW CW Gas Dynamic Laser"

E. V. LOCKE, R. HELLA, L. WESTRA, AND G. ZEIDERS

In the above correspondence,[1] the list of authors should include a fourth author, G. Zeiders.

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Contributors

Harrison H. Barrett received the B.S. degree in physics from Virginia Polytechnic Institute, Blacksburg, in 1960, the S.M. degree in physics from the Massachusetts Institute of Technology, Cambridge, in 1962, and the Ph.D. degree in applied physics from Harvard University, Cambridge, Mass., in 1968. His study at Harvard was under the Raytheon graduate study program. His doctoral thesis under the direction of Prof. R. V. Jones, concerned phonon transport in materials of the perovskite structure.

After working part time and summers in the Instrumentation Group of the Raytheon Research Division for two years, he joined the Research Division full time in June 1962. During the following year he investigated dielectric breakdown and high-field phenomena in strontium titanate. For the next five years his research was in the general area of microwave ultrasonics, including the investigation of ultrasonic attenuation mechanisms and the study of acoustic propagation in anisotropic media. He has performed the acoustic analogs of several nonlinear optics experiments and has analyzed the performance of various devices for achieving pulse compression using Bragg scattering of light by ultrasound and using acoustic surface waves. After completing the graduate program at Harvard in September 1968, he resumed full-time work at the Raytheon Research Division. His current interests include optical damage and medical electronics.

Dr. Barrett is a member of the American Physical Society, Sigma Pi Sigma, Phi Kappa Phi, and Sigma Xi.

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Michael Bass, photograph and biography not available at the time of publication.

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Paul P. Bey was born in Mason City, Iowa. He received the B.A. and M.A. degrees in physics from the University of Minnesota, Minneapolis.

From 1951 to the present he has been engaged in research work at the Naval Research Laboratory, Washington, D. C. His present area of research is quantum optics.