

FORTHCOMING PAPERS

GeO₂-Core/SiO₂-Cladding Optical Fibers Made by MCVD Process for Stimulated Raman Applications

A.-M. Peder-Gothóni, M. Leppihalme (Finland)

GeO₂-core/SiO₂-cladding optical fibers (GESI fibers) and liquid core fibers with a cladding region of GeO₂ were designed and fabricated by the MCVD process. The attenuation level of the GESI fibers was about 0.5 dB/m in the near-infrared wavelength region at 2.35 μm. GESI fibers showed a stimulated Raman scattering (SRS) spectrum with six to seven Stokes shifts of 430 cm⁻¹. The spectrum of SRS expanded to 1.6 μm when a Nd:YAG laser at a wavelength of 1.064 μm was used.

Multiple Holographic Transmission Gratings in Silver Halide Emulsion

C. W. Slinger, R. R. A. Syms, L. Solymar (UK)

Holograms, recorded in silver halide emulsion by a plane reference wave and *N* cylindrical object waves, are measured as a function of the replay beam angle both for sequential and simultaneous recording. A theoretical model, based on coupled-wave differential equations, is presented. Numerical results for the *N*=3 case are compared with experiments and good agreement is found. Cross-modulation effects caused by simultaneous recording are discussed and are shown to be detrimental to the fidelity of reproduction of the original object beams. The results are relevant to more general hologram configuration, e.g. display holograms.

Heat Flow in Interference Filters

E. Abraham, I. J. M. Ogilvy (UK)

Presented here is a linear theory of heat conduction in an interference filter with an absorbing spacer. The source of heat is a Gaussian beam. The effects of thermal properties and construction of the system on the temperature are studied. A comparison with and conditions of validity of the single-film theory are also discussed.

A Compact Automatic Wavemeter for Use with Tunable Infrared Diode Lasers

H. Lew, N. Marmet, M. D. Marshall, A. R. W. McKellar, G. W. Nichols (Canada)

A laser wavemeter based on a fringe-counting Michelson interferometer is described and its use with infrared tunable diode laser (TDL) sources is demonstrated. The wavemeter features compact vacuum-tight construction, the use of a vernier technique to ensure integral fringe counts, and the use of an inexpensive home computer circuit board for direct automatic read-out of the TDL wavenumber or wavelength. The design emphasizes compactness and ease of use at some expense in accuracy, which is limited mainly by TDL alignment and wavefront curvature effects. For routine use in the 510 μm region, the wavemeter is reliable to about 0.03 cm⁻¹ in unfavorable cases, and a factor of ten better ordinarily. With extra care in alignment of the TDL beam, or with a single „calibration“ in a given region, accuracies of 0.001 cm⁻¹ may be obtained (better than 1 part in 10⁶).

Dynamic Absorption Effects in KrF* Amplifiers

H. Jara, K. Boyer, U. Johann, T. S. Luk, I. A. McIntyre, A. McPherson, C. K. Rhodes (USA)

The results of transient loss measurements performed in a self-sustained discharge KrF* amplifier are reported. Analysis of these results gives a minimum value of 20 for the effective gain to loss ratio g_0/α_{eff} , indicating that efficient extraction of energy in subpicosecond KrF* amplifiers in the ~ 1 J range should be achievable.

N₂ Production in e-Beam Pumped XeF Lasers Containing NF₃

R. Slater (USA)

The rate of build-up of N₂ was measured in electron-beam-irradiated Ne/Xe/NF₃ mixtures using mass spectroscopy. The amount of N₂ produced indicated that N₂ is the primary nitrogen bearing stable species created in these mixtures. The rate constant for dissociative electron attachment to the NF₂ fragments produced in electron attachment to NF₃ is estimated to be ~ 5 x 10⁻⁸ cm³/s in order to explain the amount of N₂ produced.

H. Haken

Laser Theory

Corrected printing. 1984. 72 figures. XVI, 320 pages
Soft cover DM 95,-. ISBN 3-540-12188-9
(Originally published as "Handbuch der Physik/
Encyclopedia of Physics, Volume 25, 2c", 1970)

6942/4/4hc

This book, written by one of the pioneers of the laser theory, is now considered by many laser physicists as a classic. It provides a thorough introduction to quantum mechanical treatment of the laser, the semiclassical approach and the rate equation treatment. Many features of laser light starting from gross features, like intensity, to fundamental aspects, such as photon statistics and optical coherence, are treated in detail.

Springer-Verlag Berlin Heidelberg New York Tokyo

Heidelberger Platz 3, D-1000 Berlin 33
175 Fifth Ave., New York, NY 10010, USA
37-3 Hongo 3-chome, Bunkyo-ku, Tokyo 113, Japan



Applied Physics A 41, No. 4 (1986)

Solids and Materials

Applications of Amorphous Silicon

- H. Mannsperger, S. Kalbitzer, G. Müller
Doping Efficiencies of Gas-Phase and Ion-Implantation Doped a-Si:H 253
- H. Shirai, A. Tanabe, S. Oda, J. Hanna, T. Nakamura, I. Shimizu
Design of Multiple Layered a-Si:H(F)/a-SiGe_xH(F) Films for Enhancement in Photoresponse in the Near-Infrared Spectrum 259
- S. Nakano, Y. Kuwano, M. Ohnishi
High Performance a-Si Solar Cells and New Fabrication Methods for a-Si Solar Cells 267
- W. Krühler, W. Kusian, F. Karg, H. Pfeleiderer
Electrical Properties and Degradation Behavior of Hydrogenated Amorphous Si Alloys for Solar Cells 275
- S. Ohima, T. Yamada, T. Hayashida, M. Yamano
Characterization of a a-Si:H Thin-Film Transistors and the Effect of Thermal Annealing 285
- J. Symons, M. Ghannam, J. Nijs, A. van Ammel, P. de Schepper, A. Neugroschel, R. Mertens
The Use of Amorphous and Microcrystalline Silicon for Silicon Heterojunction Bipolar Transistors 291
- J. Magariño
Amorphous Silicon Diodes and TFTs for Active Matrix Flat Panel Display Applications 297
- D. E. Carlson
Hydrogenated Microvoids and Light-Induced Degradation of Amorphous-Silicon Solar Cells 305
- H. Tanaka, T. Sakai, M. Shimbo, S. Arai, T. Yamazaki
A Thin-Film Transistor with a Very Thin a-Si:H Layer and Its Application for an LC Panel 311

Surfaces, Interfaces, and Layer Structures

- F. A. Houle
Basic Mechanisms in Laser Etching and Deposition *invited* 315
- A. Kapeniaks, M. Eyett, D. Bäuerle
Laser-Induced Surface Metallization of Ceramic PLZT 331
- A. E. Bell, L. W. Swanson
The Influence of Substrate Geometry on the Emission Properties of a Liquid Metal Ion Source 335