FORTHCOMING PAPERS

Novel Achromatic Distributed Feedback Dye Laser for Subpicosecond Operation

S. Szatmári, B. Rácz (F. R. Germany)

The optimal pump arrangement of distributed feedback dye laser (DFDLs) having a greating beam splitter is analyzed in details. The upper limit of the pump spectral band width and beam divergence are given as functions of the length of the excited volume. A novel achromatic pump arrangement is reported which is capable of producting a short, high visibility interference pattern even if a divergent pump source of serval nm band width is used. The DFDL pulse duration has an estimated lower limit of 200 fs.

Characteristics of an X-Ray Preionized TEA CO Laser

R. J. Zuidema, G. J. Ernst (The Netherlands)

A cryogenically cooled sealed-off x-ray preionized self-sustained discharge CO laser was succesfully operated. It was found that 20 to 40% higher output energies could be obtained using x-ray instead of uv preionization. A maximum output energy of 2.9 per pulse could be extracted from a $2\times2\times40$ cm^3 discharge volume. The maximum electrical efficiency proved to be 12.6%.

Linear Optics of Polarization Sheets

B. U. Felderhof, G. Marowksy (F. R. Germany)

We develop a theory in which thin films or monolayers of strongly polarizable molecules are described as linear polarization sheets. We show that this concept in combination with the transfer matrix method allows a transparent derivation of the transmission and reflection properties of a composite interface.

Laser-Induced Helical Structure in the Isotropic Phase of Nematic Liquid Crystal

Zuhe Yu, Hsingmin Lu, Peixian Ye, Panming Fu (P. R. China)

We report on the first observation of laser-induced helical structure in the isotropic phase of a nematic liquid crystal. The helical structure was induced by two nearly counter-propagating waves circularly polarized in the same sense. Bragg reflection in the optical tunneling region was studied. We made an extensive investigation on the analogy between Bragg reflection from a cholesteric liquid crystal slab and four-wave mixing. It provides a deeper insight into the physics of the optical properties of cholesteric liquid crystal.

Spectral Structure of CuBr Vapor Laser Lines

Wang Yongjiang, Shen Shengpen, Xia Tiejun, Wu Zhehua, Zhu Jinmin (P. R. China)

The atomic density, the buffer gas pressure and the voltage dependence of the 510.6 nm laser line shape and its temporal evolution emitted from a Cu/CuBr vapor laser are measured. It is found that the monochromaticity of these laser lines can be improved greatly at a the relative high buffer gas pressure. The temporal evolution of the line shape offers a steroscopic view of a laser pulse. The sequence of appearrance of the peaks of the line shape is governed by the intensity of the hyperfine component of the copper line.

Laser Dye Stability, Part 12. The Pyridinium Oxazole Salts

A. N. Fletcher, R. A. Henry, M. E. Pietrak, D. E. Bliss, J. H. Hall (USA)

The fluorescence and lasing characteristics of 25 oxazole dyes have been investigated. Lasing was attempted using flashlamp pumping with and without the presence of oxygen. A few of the dyes showed the highest laser lifetimes covering the wavelength region of 495—523 nm that we have ever tested. Other dyes showed high laser outputs. Many of the dyes had useful flashlamp-pumped laser characteristics using water as the solvent. Although the best lasing conditions were observed in the absence of oxygen, good lifetimes could be obtained under air for solvents such as ethanol/water.

Applied Physics A 43, No. 3 (1987)