

Contents

Part I Generation and Amplification of Ultrashort Light Pulses

Towards a Laboratory X-Ray Laser By F.P. Schäfer (With 3 Figures)	2
Amplification of Femtosecond Light Pulses By P. Heist, F. Noack, W. Rudolph, and B. Wilhelmi (With 9 Figures)	9
Generation of Tunable Femtosecond Pulses of High Energy By P. Heist, D.V. Lap, F. Noack, W. Rudolph, and T. Schröder (With 4 Figures)	19
Analysis of Actively Mode-Locked Lasers with Intracavity Second Harmonic Generation By T. Damm, U. Stamm, K.-P. Stolberg, and B. Wilhelmi (With 6 Figures)	23
Design Considerations for a Linear Cavity Femtosecond Dye Laser By J.J. Korpershoek, E.W. Castner, Jr., and D.A. Wiersma (With 5 Figures)	27
Ultrashort Pulse Generation from the Sweeping Oscillator Dye Laser By Nguyen Dai Hung, Y. Meyer, M. Martin, and F. Nesa (With 6 Figures)	33
Ultrastable Subpicosecond Nd:Glass Laser and Stretched Pulse OPOs: A New Approach to High Intensity Tunable fs Light Fields By R. Danielius, R. Grigonis, A. Piskarskas, D. Podenas, V. Sirutkaitis, and A. Varanavichius (With 4 Figures)	40
Femtosecond Pulse Generation from a Titanium-Doped Sapphire Laser By P.M.W. French, J.A.R. Williams, and J.R. Taylor (With 6 Figures)	47
Colliding Pulse vs Mirror Contacted Dye Cell Mode-Locking Performances of a Nd:YAG Laser By G.P. Banfi, G. Gabetta, P.G. Gobbi, and G.C. Reali (With 1 Figure)	52
Diode Pumped cw Mode-Locked Nd:Glass Laser: Performance and Limitations By T. Brabec, F. Krausz, E. Wintner, and A.J. Schmidt (With 2 Figures)	56

Substructure in ps Light Pulses Emitted by Gain Switched Semiconductor Lasers By A.G.Weber, E.H. Böttcher, and D. Bimberg (With 3 Figures)	61
Generation of Tunable Femtosecond Pulses by Selective Amplification of a Continuum By J. Hebling and J. Kuhl (With 4 Figures)	67
Spectral Diagnostic Method for Temporal Study of Subpicosecond Distributed Feedback Dye Lasers By P. Simon, H. Gerhardt, and S. Szatmári (With 3 Figures)	72
Intensity Dependent Transmission of Window Materials at 248 nm By P. Simon, H. Gerhardt, and S. Szatmári (With 2 Figures)	76
On the Extension of the Matrix Formalism for the Calculation of Group Delay and Group Velocity Dispersion in Linear Optical Elements By E. Döpel	80
Limits of Pulse Generation in cw Mode-Locked Dye Lasers By V. Petrov, W. Rudolph, U. Stamm, and B. Wilhelmi (With 5 Figures)	83
A Dye Laser Synchronously Pumped by Intense Subpicosecond Pulses from a Negative Feedback Stabilized Nd:Glass Laser By T. Damm, U. Stamm, K. Vogler, Š. Burdulis, R. Grigonis, A. Piskarskas, G. Sinkevičius, and V. Sirutkaitis (With 3 Figures)	87
Beta-Barium Borate Widely Tunable Picosecond Optical Parametric Oscillators By Š. Burdulis, R. Grigonis, A. Piskarskas, G. Sinkevičius, V. Sirutkaitis, J. Nolting, and R. Wallenstein (With 4 Figures)	90
Generation and Amplification of Picosecond Pulses in the 10 μ m Region By V.M. Gordienko, Z.A. Biglov, and V.A. Slobodyanyuk (With 5 Figures)	94

Part II	Measurement, Devices and Methods
----------------	---

Lateral High Speed Photodiodes on Semi-insulating InGaAs:Fe By D. Kuhl, C.J. Wei, E.H. Böttcher, D. Bimberg, and E. Kuphal (With 5 Figures)	104
High Resolution Optical Time Domain Reflectometry for the Characterization of Integrated Optical Devices By P. Beaud, J. Schütz, W. Hodel, and H.P. Weber (With 4 Figures) . . .	111
Pulsed Excitation of a GaAlAs Semiconductor Laser by Picosecond Optoelectronic Switches By P.P. Vasil'ev, D. Grosenick, E. Klose, A.V. Konyashchenko, A.B. Sergeev, and M. Lenzner (With 3 Figures)	117

Investigation of Internal Signal Propagation of an Integrated Circuit with High Temporal Resolution By H. Bergner, T. Damm, U. Stamm, M. Müller, K.-P. Stolberg, and H. Seidel (With 4 Figures)	121
Two-Photon Luminescence in CsI:Na and Its Application for the Measurement of UV Femtosecond Light Pulses By P. Heist, R. Deich, F. Noack, W.E. Postovalov, W. Rudolph, and T. Schröder (With 5 Figures)	125
Picosecond Resolution in Optical Coherent Transient Experiments with Nanosecond Sources By A. Débarre, J.-C. Keller, J.-L. Le Gouët, and P. Tchério (With 1 Figure)	130
Enhancement of Second Harmonic Generation from a Silver Island Film by Self-Polarization By F.R. Aussenegg, A. Leitner, and J.D. Pedarnig (With 3 Figures)	136
Spectral Holography of Ultrashort Pulses and Photochronography of Ultrafast Processes with Pico- to Femtosecond Time Resolution By Yu. T. Mazurenko	140
Subfemtosecond Studies of Four-Photon Scattering in Dye Solutions By V.L. Bogdanov, A.B. Evdokimov, G.V. Lukomskij, and B.D. Fainberg (With 2 Figures)	144
Theoretical Study of Coherent Artifacts in Pump-and-Probe Experiments By E. Döpel, W. Rudolph, G. Werner, and B. Wilhelmi (With 4 Figures)	147

Part III	Light Pulse Shaping and Nonlinear Optical Phenomena
-----------------	--

Soliton Generation from c.w. Diode Laser Signals By E.J. Greer, D.M. Patrick, P.G.J. Wigley, and J.R. Taylor (With 7 Figures)	152
Nonlinear Propagation of Ultra-short Optical Pulses in Activated Fibers By E.A. Vanagas and A.I. Maimistov (With 5 Figures)	157
Influence of Various Nonlinear Optical Processes on Femtosecond Light Pulse Propagation in Fibers By J. Herrmann and B. Wilhelmi (With 4 Figures)	162
Distortion of Femtosecond Laser Pulses in Optical Systems and Their Applications By Z. Bor and G. Szabó (With 3 Figures)	168
Optical Pulse Shaping by Spectral Hole Burning Filters By R. Kaarli, P. Saari, and H. Sõnajalg (With 2 Figures)	175
High Time Resolution with Incoherent Light in the Raman Fringe Decay By K. Wynne, M. Müller, and J.D.W. van Voorst (With 2 Figures)	180

Temporal and Spatial Evolution of Picosecond Phonon-Polariton Pulses in Crystals By F. Vallée, G.M. Gale, and C. Flytzanis (With 4 Figures)	184
--	-----

Part IV	Applications to Solid-State Physics
----------------	--

Femtosecond Studies of Nonlinear Optical Processes in Wide-Gap II-VI Semiconductors By J. Puls, F. Henneberger, W. Rudolph, and D. Lab (With 6 Figures)	192
Ultrafast IR Probing of Highly Excited Semiconductors By E. Kuokštis, J. Cruz, and H.M. van Driel (With 4 Figures)	199
Picosecond Spectroscopy of Nonthermalised Electron-Hole Plasma in Highly Excited $\text{CdS}_{1-x}\text{Se}_x$ Crystals By R. Baltramiejūnas, S. Juršėnas, E. Kuokštis, and A. Žukauskas (With 3 Figures)	204
Transient Energy Transfer in ps Two-Photon Absorption Experiments in CdTe at Room Temperature By I. Rückmann, J. Kornack, J. Kolenda, and M. Petrauskas (With 6 Figures)	208
Femtosecond Dynamics of Highly Excited CuBr Microcrystallites By U. Stamm, M. Müller, M. Taiji, M. Yoshizawa, T. Kobayashi, and M. Kaschke (With 3 Figures)	213
Study of Some Optical and Electronic Properties of GaAs Through Picosecond Laser Induced Transient Gratings By A. Agnesi, G.P. Banfi, M. Costa, G. Reali, and V. Smid (With 3 Figures)	217
Investigation of the Gunn Effect in GaAs by Picosecond Photoconductivity By H. Bergner, V. Brückner, M. Lenzner, and R. Strobel (With 3 Figures)	220
Time-Resolved Luminescence Studies of Vertical Transport in Short-Period Superlattices with Enlarged Well By J. Puls, F. Henneberger, I.N. Uraltsev, A.M. Vasiliev, U. Woggon, and M. Luhn (With 5 Figures)	224
Femtosecond Spectroscopy of Semiconductor Colloids By M. Kaschke, N.P. Ernsting, and H. Weller (With 5 Figures)	228
Pump Energy Dependent Relaxation in Semiconductor-Doped Glasses By D.V. Lap, Th. Peschel, P. Heist, W. Rudolph, and H.-E. Ponath (With 8 Figures)	234

Part V Applications to Molecular Spectroscopy

Molecular Photochemistry with Femtosecond Laser Pulses By T. Baumert, B. Bühler, R. Thalweiser, and G. Gerber (With 6 Figures)	240
Femtosecond Spectroscopy of Polydiacetylene and Polythiophene By T. Kobayashi, M. Yoshizawa, U. Stamm, M. Taiji, and K. Yoshino (With 3 Figures)	248
Investigations on the Dynamics of Hydrogen Bonds by Picosecond IR Spectroscopy By H. Graener, T.Q. Ye, and A. Laubereau (With 4 Figures)	252
Sub-picosecond Time-Resolved Intramolecular Electronic Energy Transfer in Bichromophoric Molecules By M. Kaschke and N.P. Ernsting (With 6 Figures)	258
Sub-picosecond Transient Optical Absorption Spectroscopy of the Spiropyran–Merocyanine Photochromism By N.P. Ernsting (With 4 Figures)	263
Observation of Time-Resolved Absorption Anisotropy Decay Resulting from Rotation of Free Organic Molecules By N.A. Borisevich, E.V. Khoroshilov, I.V. Kryukov, P.G. Kryukov, G.B. Tolstorozhev, M.Yu. Shakhbazyan, and A.V. Sharkov (With 2 Figures)	266
Rotation of Dye Molecules Induced by Optical Excitation By D.M. Gakamsky, N.A. Nemkovich, and A.N. Rubinov (With 5 Figures)	270
Fast Structural Transformations of Organic Molecules By N.A. Borisevich, N.A. Lysak, S.V. Melnichuk, S.A. Tikhomirov, and G.B. Tolstorozhev (With 4 Figures)	276
Photoisomerization Dynamics of DODCI By A. Penzkofer and W. Bäumlér (With 6 Figures)	282
Time-Resolved Resonance-CARS Spectroscopy of the First Excited Singlet State of Stilbene-3 and of Cyanine Photoisomers By W. Werncke, A. Lau, M. Pfeiffer, Kim Man Bok, and Tschoe Jong Tscholl	286
Time-Resolved Absorption Spectroscopy of Polymethine J-Aggregates By K.-H. Feller, R. Gadonas, and V. Krasauskas (With 4 Figures)	289
Light-Induced Intramolecular Proton-Transfer in a System in Which the Excited Donor is Separated from the Acceptor by a Flexible Alkyl Chain By C.J. Jalink, A.H. Huizer, and C.A.G.O. Varma (With 4 Figures)	295

Formation, Relaxation and Recombination of Polarons and Bipolarons in Poly(1,4-phenylene-1-phenylvinylene) (MP-PPV) in the Picosecond Time Region	
By J.P. Yang, S. Rentsch, M. Lenzner, and H.L. Li (With 5 Figures) . . .	300
Non-Markovian Effects of Vibronic Relaxation in Spectroscopy with Intense USP and In-Phase Modulation of USP in a Saturable Absorber	
By B.D. Fainberg and V.N. Nazarov (With 2 Figures)	305
The Primary Steps of the Photosynthetic Process in Bacteria at Low Temperatures	
By G. Deinum, T.J. Aartsma, R. van Grondelle, and J. Amesz (With 2 Figures)	309
Femtosecond Absorption Spectroscopy of Primary Processes in Bacterial Photosynthesis Reaction Centers	
By S.V. Chekalin, Yu.A. Matveyets, and A.P. Yartsev (With 2 Figures) .	313
Evidence of Excited State Absorption of Strongly Interacting Chlorophylls Within Light-Harvesting Pigment Protein Complexes in Photosynthetic Systems	
By G. Kehrberg, J. Voigt, and T. Bittner (With 3 Figures)	317
Index of Contributors	325