TuL 9:00 am–10:00 am Grand B

Joint Symposium on Ultrafast Laser Sources

Anthony M. Johnson, *AT&T Bell Laboratories, Presider*

TuL1 (Invited) 9:00 am

Fiber-based short-pulse amplification and manipulation circuitry, David J. Richardson, *Optoelectronics Research Centre, Southampton University, Southampton SO17 1BJ, UK. E-mail: B:d,r@orc.soton.ibm.* A number of fiber-based short-pulse transformation circuits that can be used to extend the capability and usefulness of conventional fiber-based short-pulse systems are described. Pulse transformations ranging from simple amplification and compression to spectral inversion and dark-soliton formation are covered and the potential applications of such circuitry discussed.

TuL2 (Invited) 9:30 am

Ultrafast solid-state lasers using semiconductor saturable absorbers, Ursula Keller, *ETH, Switzerland.* Passive modelocking of solid-state lasers using semiconductor absorbers is reviewed. An A-FPSA inside Nd:glass and Cr:LiSAF lasers produced sub-100-fs pulses. We show that even a slow saturable absorber is able to stabilize solitary pulses much shorter than the recovery time of the absorber.

TuM 9:00 am–10:00am Topaz Room

Novel Laser Structures and Devices

Joseph F.Pinto, *Naval Research Laboratory, Presider*

TuM1 9:00 am

Microlaser: lasing with a few atoms in a single-mode resonator, Kyungwon An, James J. Childs, Ramachandra R. Dasari, Michael S. Feld, *G. R. Harrison Spectroscopy Laboratory and Department of Physics, Massachusetts Institute of Technology, 88 Massachusetts Avenue, Cambridge, MA 02139. E-mail: kwan@athena.mit.edu.* Laser oscillation with a small number of two-level atoms in a single-mode cavity with a finesse of 10^6 has been realized using a ^{138}Ba atomic beam excited by a π-pulse laser beam placed before the cavity mode. The dynamical properties as well as the photon statistics of the system are studied.

TuM2 9:15 am

Multistability in the synchronously-driven nonlinear ring cavity, A. T. Rosenberger, Jeong-Mee Kim, *Department of Physics, University of Alabama in Huntsville, Huntsville, AL 35899. I: rosenbergera@email.uah.edu.* A synchronously-driven ring cavity containing a thin medium of two-level atoms can exhibit absorptive multistability in the transmitted pulse amplitude when the upper-level lifetime is long compared to the pulse width and short compared to the round-trip time. Calculations of the effects of a Gaussian cavity mode, collisions, and variation of the ratios of the three times are reported.

TuM3 9:30 am

Coherent pulse propagation in a correlated-emission-laser medium, W. W. Dostalik, C. D. Cantrell, *Center for Applied Optics, University of Texas at Dallas, P.O. Box 830688, Richardson, TX 75083.* Results from 3D numerical simulations of laser pulse propagation in an eight-level, Zeeman, He-Ne, correlated-emission-laser (CEL) medium are presented. A semiclassical treatment to investigate transverse effects resulting from propagation is used. Such effects may play a role in proposed CEL applications.

TuM4 9:45 am

Novel transverse modes of wide-aperture lasers, J. V. Moloney, Q. Y. Feng, J. Lega,* A. C. Newell, *Department of Mathematics, University of Arizona, Tucson, AZ 85721. E-mail: jml@math.arizona.edu.* The complex spatiotemporal evolution of the near-field output of wide-aperture lasers shows a universal behavior associated with pattern formation in diverse physical systems near a critical point. A quantitative description of the transverse laser outputs in terms of universal order parameter equations is given.

* *Institute Non Lineaire de Nice.*

TuN 9:00 am–10:15 am Sapphire Room

Broadly-Tunable Lasers

Clifford Pollock, *Cornell University, Presider*

TuN1 9:00 am

Spatio-temporal studies in strongly-scattering gain media, R. M. Balachandran,* N. M. Lawandy, *Department of Physics and Division of Engineering, Brown University, Providence, RI 02912. Internet: st403401@brownvm.brown.edu.* Spatial maps of the pump and the stimulated emission fields in optically-pumped scattering-dye solutions containing TiO_2 nanoparticles have been obtained (Lawandy et al., Nature **368**(6470), 436, 1994). The emission spectrum shows a strong dependence on excitation dimensions with respect to the optical scattering length. The emission-pulse width is in the picosecond range and is limited by the pump-pulse width.

* *Department of Physics.*

TuN2 9:15 am

Narrow-linewidth solid-state dye laser oscillators, F. J. Duarte, *Eastman Kodak Company, Rochester, NY 14650-1744. fjduarte@Kodak.COM.* Dispersive dye-laser oscillators using solid-state gain media are described. Laser linewidths of ~1 GHz at efficiencies of 9% have been measured at 575 nm. Interferometric and dispersive equations are used to optimize