

trast switching of 412 fsec. soliton pulses at 46 pJ. They claim this is the lowest switching energy yet reported for all-optical switching.

As the input energy from a soliton laser was increased, the transmitted energy increased much faster than linear until, at an output energy of 46 pJ, the transmitted energy reaches 43 pJ, or 93% of the total reflected energy in a partially transmitting integrated fiber loop mirror that constituted the interferometer.

At higher input energies, the transmission falls and then rises as the second cycle of the nonlinear response occurs, the researchers report.

A weak staircase transmission function of the nonsoliton pulses emphasizes the crucial role of solitons. By changing the operating conditions of the external cavity, they were able to produce pulses longer than 412 fsec. and the staircase was observed.

The researchers also say their results confirm the viability of solitons as the natural bits of nonlinear optical processing in an all-fiber geometry. Devices based on these principles should make it possible to perform ultrafast all-optical pipeline processing, they conclude.

—George Leopold

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Optics News

ASTM drafts standards for measuring scattered light

An ASTM subcommittee set up recently to work on standardization of optical scattering measurements has begun its work by looking at Bidirectional Reflectance Distribution Function (BRDF) measurements from opaque specular and diffuse surfaces.

The impetus for this effort comes from the needs of the space-based surveillance community, as represented by the Electro-Optical Technology Branch at the USAD's Rome Air Development Center (RADC), Griffiss AFB, N.Y. As a result of a program to study the effects of scattered light on optical system performance and a survey of national optical scattering test facilities (reported in *Proc. SPIE*, 967, "BRDF Round Robin"), the need to standardize the measurement of the scattered light became obvious. To this end, Thomas Leonard of Ball Systems Engineering Division asked the ASTM Executive Committee to establish a new subcommittee on light scattering under the E-12 Committee on Appearance of Materials.

The first formal meeting of Subcommittee E12.09 was held in Fort Lauderdale in mid-January to draft a document entitled "Test Method for the Determination of the Amount and Angular Distribution of Optical Scatter from an Opaque Surface."

At this meeting, members also voted to establish an *ad hoc* panel to explore and recommend other standard test methods and practices to be studied by the E12.09 Subcommittee. Some of the subjects for consideration include reference samples for scatter measurements, bidirectional scatter and transmission distribution functions, BSDF and BTDF, respectively. Panel members are Robert Breault, John Stover, and Michael Pantalano.

The subcommittee met this spring to review a final draft of the BRDF standard. Results of their balloting will be tabulated and assessed during the SPIE Annual Meeting in San Diego in August.

For questions about the technical aspects of this work or copies of the proposed draft standard, contact Tom Leonard at (513) 429-5005 or Bruce Thompson at (315) 339-5010. For questions about membership in ASTM and work on Subcommittee E12.09, call Wendy Dyer, ASTM Manager of New Activities and Membership Promotion, (215) 299-5400.

—Robert E. Parks

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Included in this document are bountiful indices on income, highest degree held, training courses, ethnicity, fringe benefits, etc. Over 7,000 individuals were surveyed—3.5% of the U.S. non-student, higher-grade membership to IEEE. A discussion and statistics of types of retirement planning and an overview of past surveys dating back to 1972, when IEEE began its survey, are also included.

The document was prepared by WESTAT Inc. in Rockville, Md., and may be obtained by contacting IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, N.J. 08855-1331. The catalogue number is UH0183-4.