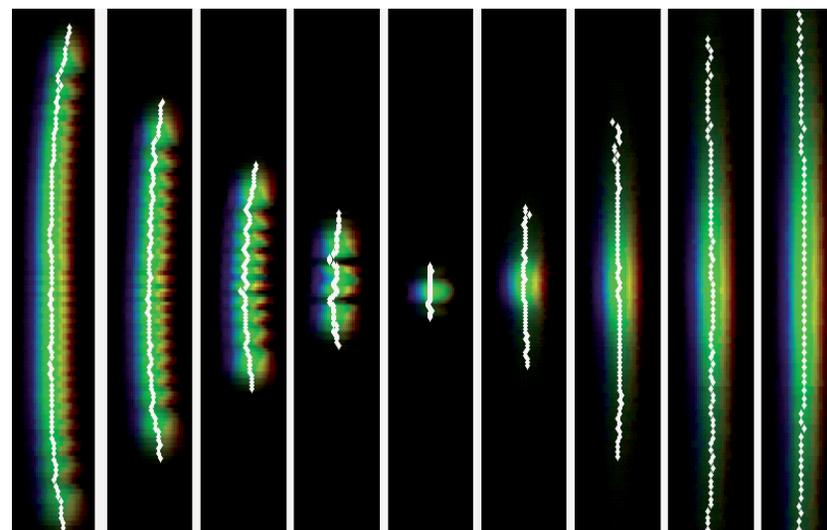


Measuring the complete spatio-temporal electric field of ultrashort laser pulses



Rick Trebino
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PhD Stanford Applied Physics, 1983
Sandia National Labs 1986-1998
Georgia Tech 1998 -

3:00 pm, Monday, November 26, 2007
Sloan Auditorium
Goergen Building
Refreshments follow

This talk reviews a new technique that can measure the complete spatio-temporal profile of a laser pulse near a focus in a single shot.

Measuring the complete spatio-temporal electric field of ultrashort laser pulses

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Abstract: While techniques for characterizing the temporal or spatial field of ultrashort light pulses exist, measuring the complete spatio-temporal field is much more difficult, especially at or near a focus or on a single shot. Indeed, most applications of ultrashort pulses involve focusing the pulse, and it's at the focus where it matters. We've recently developed the first technique that measures the complete $E(x,y,z,t)$ *at and near a focus* and the first technique to measure $E(x,y,z,t)$ *on a single shot*. These methods are remarkably simple to set up and use.

Biography: Rick Trebino was born in Boston, Massachusetts on January 18, 1954. He received his B.A. from Harvard University in 1977 and his Ph.D. degree in Applied Physics from Stanford University in 1983. His dissertation research involved the development of a technique for the measurement of ultrafast events in the frequency domain using long-pulse lasers by creating moving gratings. He continued this research during a three-year term as a physical sciences research associate at Stanford.

In 1986, he moved to Sandia National Laboratories in Livermore, California, where he studied higher-order wave-mixing, nonlinear-optical perturbation theory using Feynman diagrams, and ultrashort-laser-pulse measurement techniques. There he developed Frequency-Resolved Optical Gating (FROG), the first technique for the measurement of the time-dependent intensity and phase of ultrashort laser pulses.

In 1998, he became the Georgia Research Alliance-Eminent Scholar Chair of Ultrafast Optical Physics at the Georgia Institute of Technology, where he currently studies ultrafast optics and applications.

Prof. Trebino has received several prizes, including the SPIE's Edgerton Prize, and he is a Fellow of the Optical Society of America and the American Physical Society. His interests include adventure travel, archaeology, and primitive art.