

Curriculum Vitae

Kurt Edmund Oughstun
Professor of Electrical Engineering & Mathematics
University of Vermont

Education:

- 1972 B.A. Cum Laude in Physics & Mathematics
 Central Connecticut State University
- 1974 M.S. in Optical Engineering
 The Institute of Optics, University of Rochester
- 1978 Ph.D. in Optics
 The Institute of Optics, University of Rochester
 Dissertation: *Propagation of Optical Pulses in Dispersive Media.*

Research Experience:

Basic research experience in electromagnetic and optical field theory, wave propagation phenomena, and applied mathematics. Specific research interests include asymptotic analysis, the frequency- domain and time-domain representations of electromagnetic, optical, and acoustic wave fields, electromagnetic properties of dielectric, conducting, and semiconducting materials, diffraction and scattering theory, coherence theory, the rigorous description of dispersive pulse propagation in both linear and nonlinear media and waveguiding structures, nonlinear optics, and laser physics. Applied research interests in ultrawideband-signal, ultrashort-pulse electromagnetic field characteristics, impulse radar systems, stable and unstable open optical cavity mode properties, optical beam transfer systems, adaptive optics, integrated optics devices, fiber optics communications systems, and image recognition.

Recent Publications:

1. K. E. Oughstun and G. C. Sherman, "Asymptotic Theory of Pulse Propagation in Absorbing and Dispersive Dielectrics," (Invited Paper), in *Review of Radio Science, 1990-1992*, Union Radio-Scientifique Internationale, pp. 75-105 (Oxford University Press, Oxford, 1993).
2. C. M. Balicstis and K. E. Oughstun, "Uniform Asymptotic Description of Ultrashort Gaussian Pulse Propagation in a Causal, Dispersive Dielectric," *Physical Review E* 47, 5, 3645-3669 (1993).

3. K. E. Oughstun, "Dynamical Structure of the Precursor Fields in Linear Dispersive Pulse Propagation in Lossy Dielectrics," (Invited Paper), in *Ultra-Wideband, Short-Pulse Electromagnetics 2*, L. Carin and L. B. Felsen, eds., pp. 257-272 (Plenum Press, New York, 1994).
4. G. C. Sherman and K. E. Oughstun, "Energy Velocity Description of Pulse Propagation in Absorbing, Dispersive Dielectrics," *Journal of the Optical Society of America B* 12, 2, 229-247 (1995).
5. K. E. Oughstun, "Noninstantaneous, Finite Rise-Time Effects on the Precursor Field Formation in Linear Dispersive Pulse Propagation," *Journal of the Optical Society of America A* 12, 8, 1715-1729 (1995).
6. K. E. Oughstun and C. M. Balitsis, "Gaussian Pulse Propagation in a Dispersive, Absorbing Dielectric," *Physical Review Letters* 77, 11, 2210-2213 (1996).
7. J. A. Marozas and K. E. Oughstun, "Electromagnetic Pulse Propagation Across a Planar Interface Separating Two Lossy, Dispersive Dielectrics," in *Ultra-Wideband, Short-Pulse Electromagnetics 3*, C. Baum, L. Carin and A. P. Stone, eds., pp. 217-230 (Plenum Press, New York, 1996).
8. C. M. Balitsis and K. E. Oughstun, "Generalized Asymptotic Description of the Propagated Field Dynamics in Gaussian Pulse Propagation in a Linear, Causally Dispersive Medium," *Physical Review E* 55, 2, 1910-1921 (1997).
9. K. E. Oughstun and H. Xiao, "Failure of the Quasimonochromatic Approximation for Ultrashort Pulse Propagation in a Dispersive, Attenuative Medium," *Physical Review Letters* 78, 4, 642-645 (1997).
10. H. Xiao and K. E. Oughstun, "Hybrid Numerical-Asymptotic Code for Dispersive Pulse Propagation Calculations," *Journal of the Optical Society of America A* 15, 5, 1256-1267 (1998).
11. J. A. Solhaug, K. E. Oughstun, J. J. Stamnes, and P. D. Smith, "Uniform Asymptotic Description of the Brillouin Precursor in a Lorentz Model Dielectric," *Journal of the European Optical Society A, Pure and Applied Optics* 7, 3, 575-602 (1998).
12. K. E. Oughstun, "The Angular Spectrum Representation and the Sherman Expansion of Pulsed Electromagnetic Beam Fields in Dispersive, Attenuative Media," *Journal of the European Optical Society A, Pure and Applied Optics* 7, 5, 1059-1078 (1998).
13. J. A. Solhaug, J. J. Stamnes, and K. E. Oughstun, "Diffraction of Electromagnetic Pulses in a Single-Resonance Lorentz Model Dielectric," *Journal of the European Optical Society A, Pure and Applied Optics* 7, 5, 1079-1101 (1998).
14. P. D. Smith and K. E. Oughstun, "Electromagnetic Energy Dissipation and Propagation of an Ultrawideband Plane Wave Pulse in a Causally Dispersive Dielectric," *Radio Science* 33, 6, 1489-1504 (1998).
15. K. E. Oughstun and C. C. Khamnei, "Three-Dimensional Field Structure in Open Unstable Resonators. Part I: Passive Cavity Results," *Optics Express* 4, 10, 388-399 (1999).

16. C. C. Khamnei and K. E. Oughstun, "Three-Dimensional Field Structure in Open Unstable Resonators. Part II: Active Cavity Results," *Optics Express* 4, 10, 400-410 (1999).
17. J. E. K. Laurens and K. E. Oughstun, "Electromagnetic Impulse Response of Triply-Distilled Water," in *Ultra-Wideband, Short-Pulse Electromagnetics 4*, (to be published).
18. P. D. Smith and K. E. Oughstun, "Ultrawideband Electromagnetic Pulse Propagation in Triply-Distilled Water," in *Ultra-Wideband, Short-Pulse Electromagnetics 4*, (to be published).
19. H. Xiao and K. E. Oughstun, "Failure of the Group Velocity Description for Ultrawideband Pulse Propagation in a Double Resonance Lorentz Model Dielectric," *Journal of the Optical Society of America B* (to be published).

Recent Conference & Symposium Presentations:

1. K. E. Oughstun, "Ultrashort-Ultrawideband Pulse Propagation in Temporally Dispersive Dielectrics," (Invited Paper), 1995 Norwegian Conference on Optics and Optoelectronics (Ustaaset, Norway).
2. K. E. Oughstun, "Asymptotic Description of Transient Electromagnetic Wave Propagation in Lossy Dispersive Media," (Invited Paper), 1995 IEEE AP-S International Symposium and USNC/URSI Radio Science Meeting (Newport Beach, California).
3. K. E. Oughstun, "Role of the Precursor Fields in Linear Dispersive Pulse Dynamics," (Invited Paper), 1995 Progress in Electromagnetics Research Symposium (University of Washington, Seattle).
4. R. A. Albanese, K. E. Oughstun, J. W. Penn, and R. L. Medina, "Transient Polarization Responses in Tissue," Society for Bioelectric Diagnosis and Repair (Washington, D.C., 1995).
5. K. E. Oughstun, "The Angular Spectrum Representation and the Sherman Expansion of Pulsed Electromagnetic Beam Fields in Lossy, Dispersive Media," (Invited Paper), 1996 USNC/URSI National Radio Science Meeting (University of Colorado, Boulder).
6. J. A. Marozas and K. E. Oughstun, "Electromagnetic Pulse Propagation Across a Planar Interface Separating Two Lossy, Dispersive Dielectrics," Third International Conference on Ultra-Wideband, Short-Pulse Electromagnetics (USAF Phillips Laboratory, Albuquerque, 1996).
7. H. Xiao and K. E. Oughstun, "Ultrawideband Pulse Propagation and the Quasimonochromatic Approximation," 1996 Annual Meeting of the Optical Society of America.
8. C. C. Khamnei and K. E. Oughstun, "Three-Dimensional Mode Field Distribution in an Open Unstable Cavity," 1996 Annual Meeting of the Optical Society of America.
9. K. E. Oughstun and H. Xiao, "Failure of the Slowly-Varying Envelope Approximation for Ultrashort Optical Pulse Propagation in a Dispersive,

- Attenuative Medium," 1997 Norwegian Conference on Optics and Optoelectronics (Geiranger, Norway).
10. K. E. Oughstun, "Transient Field Properties of Ultrawideband Pulse Propagation in Complex Dispersive Media," (Invited Paper), 1997 Progress in Electromagnetics Research Symposium (Schlumberger-Doll Research, Cambridge, Massachusetts).
 11. H. Xiao and K. E. Oughstun, "Failure of the Slowly-Varying Envelope Approximation for Ultrashort Pulse Propagation in a Dispersive, Lossy Medium," 1997 Progress in Electromagnetics Research Symposium (Schlumberger-Doll Research, Cambridge, Massachusetts).
 12. K. E. Oughstun and H. Xiao, "Influence of the Precursor Fields on Ultrashort Pulse Autocorrelation Measurements," 1997 Annual Meeting of the Optical Society of America.
 13. C. C. Khamnei and K. E. Oughstun, "Three-Dimensional Mode Field Distribution in an Open Unstable Cavity with Saturable Gain," 1997 Annual Meeting of the Optical Society of America.
 14. K. E. Oughstun, "The Angular Spectrum Representation and the Sherman Expansion of Pulsed Electromagnetic Beam Fields in Dispersive, Attenuative Media" Workshop on Physical Optics and Coherence Theory in Honour of Professor Emil Wolf on his 75th Birthday, co-located at the 1997 Annual Meeting of the Optical Society of America.
 15. J. E. K. Laurens and K. E. Oughstun, "Electromagnetic Impulse Response of Triply-Distilled Water," Fourth International Conference on Ultra-Wideband, Short-Pulse Electromagnetics (Tel Aviv University, Tel Aviv, Israel, 1998).
 16. P. D. Smith and K. E. Oughstun, "Ultrawideband Electromagnetic Pulse Propagation in Triply-Distilled Water," Fourth International Conference on Ultra-Wideband, Short-Pulse Electromagnetics (Tel Aviv University, Tel Aviv, Israel, 1998).
 17. H. Xiao and K. E. Oughstun, "Influence of the Precursor Fields on Ultrashort Pulse Frequency-Resolved Optical Gating Measurements," 1998 Annual Meeting of the Optical Society of America.
 18. Qiaoqiao Wu and K. E. Oughstun, "Ultrashort-Ultrawideband Pulse Precursor Field Measurements using the Windowed Fourier Transform," 1998 Annual Meeting of the Optical Society of America.

Research Monographs:

1. K. E. Oughstun, ed., *Selected Papers on Scalar Wave Diffraction*, SPIE Milestone Series, vol. MS51 (SPIE Optical Engineering Press, Bellingham, 1992).

2. K. E. Oughstun and G. C. Sherman, *Electromagnetic Pulse Propagation in Causal Dielectrics*, Springer Series on Wave Phenomena, vol. 16 (Springer-Verlag, Berlin-Heidelberg, 1994).