

Terahertz Wave Air Photonics

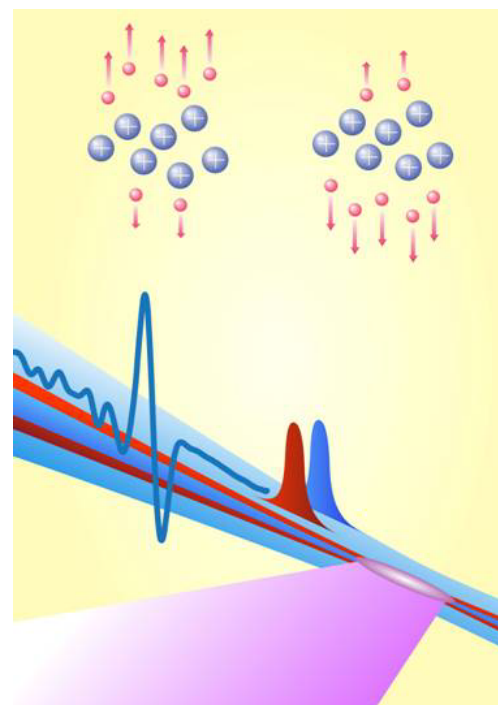


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BS in Physics, Peking University, 1982
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I will report recent development of THz
radiation-enhanced-emission-of-fluorescence (REEF)
and THz-enhanced acoustic (TEA) techniques.
Remote generation at 30 meters and remote detection
at 10 meters are demonstrated.



Special Day and Time
10:30 am, Thursday, April 28, 2011
Sloan Auditorium, Goergen 101
Refreshments provided.

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Abstract

Historically, terahertz (THz) technologies were mainly used within the astronomy community for searching far-infrared radiation (cosmic background), and the laser fusion community for the diagnostics of plasmas. Since early 90s, especially after David Auston and Dan Grischkowsky's pioneer work, THz time-domain spectroscopy has been developed rapidly and been applied on the measurement of semiconductor, electro-optic crystals, and selected chemical, biological and explosive materials. Currently the majority measurements use the linear transmission or reflection.

Air, especially femtosecond laser ionized air (plasma), has been used to generate intense peak THz waves (THz field > 2.5 MV/cm) with a broadband spectrum (10% bandwidth covers entire THz gap). THz wave air photonics has nonlinear spectroscopic and remote sensing capabilities.

I will report recent development of THz radiation-enhanced-emission-of-fluorescence (**REEF**) and THz-enhanced acoustic (**TEA**) techniques. By “**seeing**” the fluorescence, or “**hearing**” the sound, coherent detection of THz waves at standoff distance is feasible. Remote generation at 30 meters and remote detection at 10 meters are demonstrated.

Biography

Dr. Xi-Cheng Zhang – Eric Jonsson Professor of Science, Professor and Acting Head of Physics, Professor of Electrical Engineering, and Director of the Center for THz Research at Rensselaer. Dr. Zhang has received 26 US patents, published 18 books and book chapters, and has authored or co-authored over 300 refereed journal papers. He is a Fellow of IEEE, the Optical Society of America, and the American Physics Society.