Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Terahertz time domain spectroscopy of hollow polycarbonated metal waveguides APARAJITA BANDYOPADHYAY, AMARTYA SENGUPTA, JOHN FEDERICI, New Jersey Institute of Technology, VALENCIA JOHNSON, JAMES HARRINGTON, Rutgers-The State University of New Jersey — Recently, the terahertz region of the electromagnetic spectrum has gained critical significance in various technical applications and fundamental research problems, involving non-destructive evaluation of material parameters, bio-medical imaging, remote sensing and security screening. However, for applications in which THz radiation needs to be transmitted over a long distance without atmospheric absorption, a flexible waveguide could have potential applications simplifying the propagation of THz radiation in remote locations. Different structures like rigid hollow metallic waveguides, solid wires, or short lengths of solid-core transparent dielectrics such as sapphire and plastic have already been explored for THz guiding purposes. Recently, it has been reported that Cu coated flexible, hollow polycarbonate waveguide has a low loss of less than 4 dB/m in single mode operation, at 1.89 THz. In the present study, using a broadband THz source of photoconductive antennae, we characterize the loss and dispersion profile of Cu coated flexible, hollow polycarbonate waveguide having an inner diameter of 2mm. Insertion loss and the attenuation coefficient were calculated using waveguides of lengths between 40mm and 70mm.

Aparajita Bandyopadhyay
New Jersey Institute of Technology

Date submitted: 28 Nov 2005 Electronic form version 1.4