Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Electro-optic sensors for high power microwave measurements ANTHONY GARZARELLA, DONG HO WU, Naval Research Lab — Nonperturbative measurements of high power microwave fields utilizing electro-optic (EO) field sensors are described. Conventional metallic-based field probes (such as dipole antennas) perturb the very fields they measure and typically saturate for field strengths exceeding ∼1000 V/m. EO sensors are all-dielectric, have large intrinsic bandwidths (DC to THz), and measure the true waveform of the field noninvasively. Nonlinear EO crystals such as Lithium Niobate or Potassium Dideuterium Phosphate have half-wave retardation fields of the order 10^6 V/m, making them ideal for high power microwave applications. Initial field tests with our EO sensors revealed several sources of noise and instability which are normally not encountered in laboratory settings. In this presentation, we describe a newly-designed EO sensor and how it is configured to address the noise issues in high power microwave field tests. Using this improved sensor configuration, electric field measurements in the near and far field regions of a radiating microwave horn antenna are presented.

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Date submitted: 19 Nov 2008 Electronic form version 1.4