Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

**Using Rydberg Atom Electromagnetically Induced Transparency for Microwave Electrometry Applications**[1] JONATHON SEDLACEK, HAO-QUAN FAN, University of Oklahoma, RENATE DASCHNER, Physikalisches Institut, Universität Stuttgart, CHARLES EWEL, HARALD KÜBLER, JAMES SHAFFER, University of Oklahoma — We present a method to probe microwave fields and atom surface interactions using Rydberg atom electromagnetically induced transparency (EIT). The basic mechanism is to couple an external microwave field or surface polariton modes to a ladder-type Rydberg atom EIT system. Our technique is sensitive to both the amplitude and the polarization of the microwave field. In addition to developing this method for a microwave electric field standard, we are applying it to study Rydberg atoms interacting with surface polaritons and near-field effects with sub-wavelength resolution. We also investigate improvements in our sensitivity based on using dispersive, rather than absorptive effects, induced in the atoms.

[1]We acknowledge funding from DARPA and NSF.

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Date submitted: 23 Jan 2013 Electronic form version 1.4