Abstract Submitted
for the 4CF10 Meeting of
The American Physical Society

Measurement of liquid permittivity by solenoid self-resonance PATRICK GETZ, BRIAN MAZZEO, Brigham Young University — Permittivity of a liquid is an important macroscopic property which is dependent on the composition and physical state of the liquid. Measurement of liquid permittivity is usually performed using a parallel-plate capacitor or terminated coaxial line. In this study, a solenoid surrounding a column of liquid is used to measure permittivity changes. The inductance of the solenoid is not greatly affected by permittivity and conductivity changes for small diameters. However, the self-capacitance is greatly affected by changing solution conditions. The self-resonance, due to the changing self-capacitance, thus reveals properties of the solution. This is demonstrated on a variety of liquids with varying permittivity and conductivity.

Patrick Getz
Brigham Young University

Date submitted: 09 Sep 2010 Electronic form version 1.4