

Abstract Submitted
for the 4CF09 Meeting of
The American Physical Society

RF Liquid Measurement Of Capillary Tubes BASHUDEV
POUDYAL, BRIAN MAZZEO, KARL WARNICK, Brigham Young University —
Electromagnetic measurements of capillary tubes containing liquids can reveal solution properties for industrial, biological, and chemical processes. An analytical model was created for a perpendicular arrangement of SMA cables and a capillary tube. Numerical simulations in Ansoft High Frequency Structural Simulator were performed on the simple arrangement. The transmission parameters of the capillary tube were simulated between two lumped ports over a frequency range from 1 GHz to 20 GHz. Sensitivity of the transmission parameters to solution conditions were calculated for DI water and other variations of conductivity and permittivity. Experiments were performed on a capillary tube in a perpendicular arrangement using an HP 8720B Network Analyzer. The transmission parameters were measured and the resulting data was compared with the simulations. This measurement method can be adapted to different tube and solution conditions.

Bashudev Poudyal
Brigham Young University

Date submitted: 25 Sep 2009

Electronic form version 1.4