

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Dielectric measurements above 100 GHz using a high-Q open hemispherical resonator REZWANUR RAHMAN, JOHN SCALES, Department of Physics, Colorado School of Mines — High-Q cavities can be used to study materials (or perturbations to materials) whose effects are too small to be seen by other methods. We have developed a millimeter wave cavity operating above 100 GHz in order to measure the dielectric properties of thin films and ultra low loss materials. The cavity is a open hemispherical resonator. Millimeter waves are introduced and measured via 2 closely spaced sub-wavelength holes in the center of a 15cm spherical, copper mirror. Cavity perturbation techniques are applied to extract the complex permittivity of a sample. This is a paraxial system and axisymmetric modes are of primary interest but nonaxisymmetric modes are also generated and need to be dealt with. Applications to thin films and other materials will be shown. This was partially supported by US Department of Energy under grant DE-FG02-09ER16018

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Date submitted: 18 Nov 2010

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