# Determination of Dielectric Properties of Materials Using a Coaxial Cavity System Driven by a Coaxial Line

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In this paper, a new scheme for characterizing dielectric materials over a wide band of frequencies is presented. The scheme utilizes a coaxial cavity partially or completely filled with material and driven by a coaxial line. This system is analyzed by the mode-matching technique. The effect of the ohmic loss of the cavity wall on the characterization of the dielectric material is addressed. The permittivity of the filling material is inversely determined from the measured reflection coefficient of the incident TEM wave to the cavity.

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