Abstracts

A New Method for Measuring Properties of Unhomogeneous Materials Using a Two-Polarization Forward-Scattering Measurement

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A new method for measuring properties of grainy materials using a two-polarization scattering measurement combined with the free-space phase measurement is introduced. Theoretical backround of the measurement method is presented. Laboratory measurements of the depolarized scattering cross sections of white rice, green lenses, polystyrene grains, polyethene grains and mixtures of them at 10 and 35 GHz using a vector network analyzer and two horn antennas are presented. Results are compared with those based on the first order multiple scattering theory. Also laboratory tests of the compensation of the effects of changes in the number density the permittivity of the inclusions of mixtures using a phase measurement are presented. A low-cost measurement set-up for industrial measurements is also suggested.

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