532. Title:Resolving Phase Ambiguity in the Inverse Problem of Transmission /Reflection Measurement Methods

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Abstract:Inherent to transmission/reflection measurement methods and posed by the multiple-valued logarithm function of the complex transmission coefficient, the phase ambiguity problem is solved by the phase wrapping technique. Here extended and generalized, the proposed technique relies on properly adding to the phase of the complex logarithmic function a stepwise function built in from the resonance frequencies at which the phase of the transmission coefficient reaches ±π. In a concrete example the method is illustrated by correctly retrieving from complex scattering parameters the constitutive parameters of a highly-dispersive medium (distilled water) over the 0-250 GHz frequency range. Implication of a mathematically negative wavelength is also discussed.