Abstracts

An Improved Method for Measuring Scattering Parameters of Nonreciprocal Two-Ports (Comments and Authors' Reply)

H.M. Altschuler, G.R. Hoffman and A.A. Willem. "An Improved Method for Measuring Scattering Parameters of Nonreciprocal Two-Ports (Comments and Authors' Reply)." 1968 Transactions on Microwave Theory and Techniques 16.4 (Apr. 1968 [T-MTT]): 261-262.

In the above correspondence Hoffman and Willem suggest as new that, to reduce measurement uncertainty, the ratio |a/sub 1//a/sub2/| can be judiciously adjusted to obtain magnification or shrinking of the data loci. This author would agree with their conclusion but would like to point out that this technique was fully discussed several years ago. Their contribution then lies in the innovation of using a family of circles based on several |a/sub 1//a/sub 2/| ratios to obtain still further averaging of both phase and magnitude. While the use of several |a/sub 1//a/sub 2/| ratios certainly has its superficial attractions, caution is needed against its use in the context of their procedure and of the experimental setup of their Fig. 3: The "bridge imbalance" error, i.e., either the uncertainty in first adjusting |a/sub 1/| to equal |a/sub 2/| or that of determining the value of |a/sub 1//a/sub 2/|, contributed by the use of only a single slotted line, can easily overshadow the errors that are presumably reduced by the authors' approach. Consequently, it is suggested that two slotted lines and careful bridge balancing techniques be used in any case, especially when the average data of several concentric circles is taken in the hope of reducing measurement uncertainty.

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