Abstracts

On the Use of Regularization Techniques in Numerical Inverse-Scattering Solutions for Microwave Imaging Applications

S. Caorsi, S. Ciaramella, G.L. Gragnani and M. Pastorino. "On the Use of Regularization Techniques in Numerical Inverse-Scattering Solutions for Microwave Imaging Applications." 1995 Transactions on Microwave Theory and Techniques 43.3 (Mar. 1995 [T-MTT]): 632-640.

This paper deals with integral-equation-based numerical methods for microwave imaging using regularization procedures to overcome ill-conditioning problems. The strong dependence of reconstruction quality on "a priori" information is discussed. Such information is required to select a suitable number of independent columns when using truncated pseudoinversions (or other regularization parameters, in different cases) for accurate dielectric reconstructions. Moreover, a criterion for the choice of the optimal number of independent columns is proposed, and the possibility of making this choice less critical by using a multiview version of the method is explored. Finally, a modified procedure is presented that further increases the range from which to choose the number of independent columns that allows one to achieve acceptable reconstructions.

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