Abstracts

An iterative measured equation technique for electromagnetic problems

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An iterative measured equation technique (IMET) is presented for a numerical solution of electromagnetic problems. This technique is an extension and improvement of the method of measured equation of invariance (MEI). In this technique, an iterative scheme is designed in such away that a new set of metrons used to generate the measured equations is formed in each iteration based on the solution of the previous iteration. The new metrons are more meaningful in that they converge to the physical quantity of interest such as the surface current density for electrodynamic problems and the surface charge density for electrostatic problems. The IMET offers several advantages over the MEI method because it requires only two mesh layers, resulting in a significant reduction in the memory requirement and computing time. More importantly, it provides a means for a systematic improvement of the accuracy of solution. The IMET is applied successfully to two-dimensional (2-D) electrodynamic and three-dimensional (3-D) electrostatic problems. Numerical results show that the technique is highly accurate and the iterative process converges very quickly, usually within two iterations.

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