Abstracts

Use of Finite Difference Approximations to Partial Differential Equations for Problems Having Boundaries at Infinity (Correspondence)

A computationally simple technique is presented for solving finite difference equations arising from potential problems, part of whose boundary is at infinity. The procedure makes use of an arbitrary "fictitious" boundary drawn close to the regions of physical interest. An initial guess is made of the potential on this boundary as well as at all interior points. Well-known iterative techniques are used to correct the values of the interior potentials. Meanwhile the potentials on the boundary are corrected iteratively by recalculating them from the sources or charges in the entire region, which in turn are calculated from the current iteration of the interior potential. The technique is valid even if parts of the physical structure, such as an air-dielectric interface in microstrip, extend toward infinity. The fictitious boundary need not include all of the structure, providing the rate of falloff of the sources outside the boundary is known.

❏

Click on title for a complete paper.