Abstracts

Spherical wave sources in FDTD

A method is described which simulates the propagation of electromagnetic waves as spherical wave modes, approximated by an FDTD method. Modal equations in radius and time are discretized for explicit time-stepping. Angular functions are implemented analytically as required. Computed results for two examples are compared with analytic solutions - a resonator and a dipole near a conducting sphere - to demonstrate the validity of the method with very good agreement. This method is intended as a source condition in total/scattered FDTD methods, to allow for modeling of near-field object interactions without explicitly modeling the source.

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