

Abstracts

An improved FDTD model for the feeding gap of a thin-wire antenna

S. Watanabe and M. Taki. "An improved FDTD model for the feeding gap of a thin-wire antenna." 1998 Microwave and Guided Wave Letters 8.4 (Apr. 1998 [MGWL]): 152-154.

In calculations using the finite-difference time-domain (FDTD) method, the feeding gap of a thin-wire antenna is often modeled by a so-called "one-cell gap" which lets the feeding gap to be one interval of Yee's lattice. This is often inconsistent with the actual situation and it causes error in FDTD calculation results. This work shows that the error due to the one-cell gap model is strongly dependent on the cell size, and we present an improved FDTD model which assumes an infinitesimally narrow feeding gap. We show that the antenna input impedance calculated with the new gap model is barely affected by the cell size and agrees well with the method of moments (MoM) calculation results for an infinitesimal gap. Furthermore, we clarify the dependence of error of a one-cell gap on the cell size on the basis of the proposed model.

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