Abstracts

Towards accurate time-domain simulation of highly conductive materials

Chenghao Yuan and Zhizhang Chen. "Towards accurate time-domain simulation of highly conductive materials." 2002 MTT-S International Microwave Symposium Digest 02.2 (2002 Vol. II [MWSYM]): 1135-1138 vol.2.

Accurate simulation of highly conductive materials such as copper at RF and microwave frequency has presented a great challenge with the conventional FDTD method. The reason is that for a FDTD recursive computation to be accurate and stable, the FDTD time step has to be very small, leading to sometimes a prohibitively large number of iterations. In this paper, the recently developed unconditionally stable ADI-FDTD method is revised and applied to solve the problem. It is shown, through the examples of computation of body of rotational (BOR) cavities with highly conductive walls, that the highly conductive materials can now be accurately simulated. In addition, a general unconditionally stable cylindrical ADI-FDTD formulation is developed to facilitate the computation of cylindrical structures with conductive loss.

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