Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

FDTD simulations of the losses in complex electromagnetic cavities[1] FRANCO MOGLIE, LUCA BASTIANELLI, VALTER MARIANI PRIMIANI, Universita‘ Politecnica delle Marche - DII, Ancona, EMC TEAM — The simulations of complex electromagnetic cavities like reverberation chambers (RC) require a massive parallel computer to accurately account the complex three dimensional geometry. A parallel finite-difference time-domain (FDTD) code optimized for a massive parallel computer could lose its efficiency if the losses are concentrated in some part of the computation volume. For example, the simulation of the finite conductivity of the cavity metallic walls requires a significant overcharge for the computer processors that handle the boundary part of the global computational domain. Our in-house parallel FDTD code replaces the volumetric losses in every cell of the grid instead of the Ohmic losses on the walls. In this contribution, we evaluate the difference in the field distribution inside the cavity due to this replacement. Moreover, we compare the common RC statistics like the number of stirrer uncorrelated positions and the field uniformity, and the resources required for the two methods are reported and discussed. Finally, the numerical results will be compared with the measurements of the RC in our laboratory with a volume of 60 m^3 and plated steel walls in the frequency range 0.2-1.0 GHz, that includes the transition from the undermoded to the overmoded region.

[1]We acknowledge PRACE for awarding us access to resource FERMI based in Italy at CINECA

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Date submitted: 06 Nov 2015 Electronic form version 1.4