

Simulated configuration

In order to standardize SAR averaging algorithm and test the consistency of the different numerical codes the specific benchmark tests have been developed and used by the IEEE 62704-1 and IEEE 62704-2 standard development working groups.

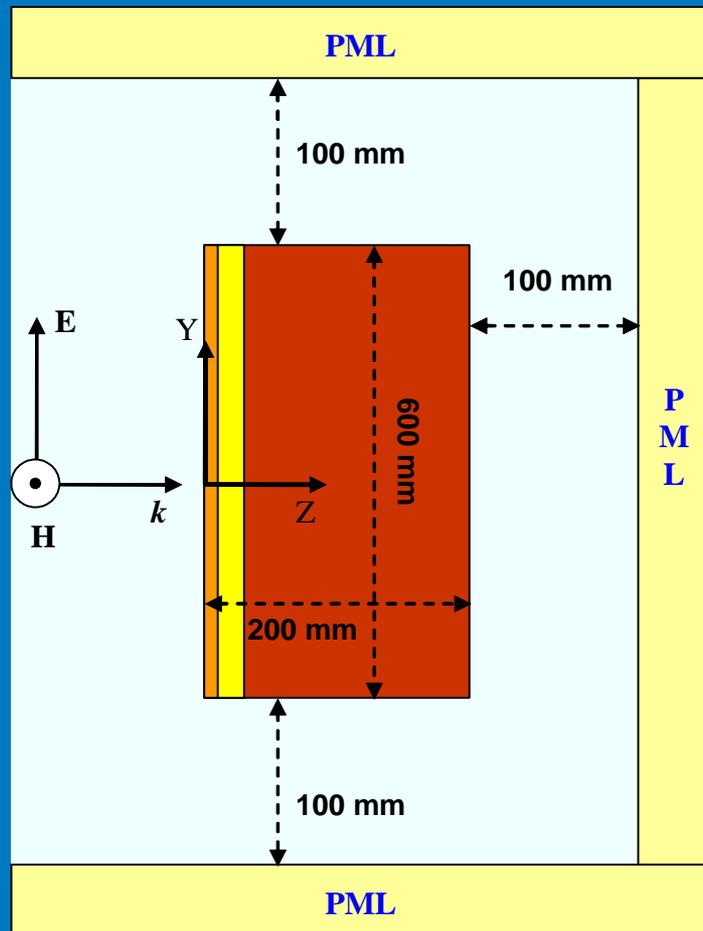
The specific test configuration described below comprises the multilayer object irradiated by a plane wave impinging normally to the surface of the outmost layer.

Details of the simulated configuration are given on the next slide.

XFDTD version 7.1 was one of the codes used to compute SAR in this test and the results generated by this code were consistent with those produced by other commercial codes which were developed to comply with the IEEE 62704-1 SAR averaging requirements.

The distribution and values of the voxel and 1-g SAR were computed and recorded along the three reference lines as described below. The results are in very good agreement among the different simulation tools and the peak 1-g SAR values computed along the reference lines by XFDTD do not differ from the average values by more than 3%.

Simulated configuration



Rectangular layered brick with dimension (400 x 600 x 200) mm. The layers are 5 mm of skin, 10 mm of fat and the rest is muscle tissue meshed with 5 mm resolution grid

PML in the computational domain at a distance of 100 mm from the brick at all sides except at the back of the brick.

Coordinate system at the center of the largest surface of the brick (see figure below) with Y axis parallel to the longest side of the brick

Tissue	Epsilon	Sigma, S/m	Mass density, kg/m ³
Skin	61.5	0.54	1125
Fat	5.85	0.037	916
Muscle	62.2	0.73	1047

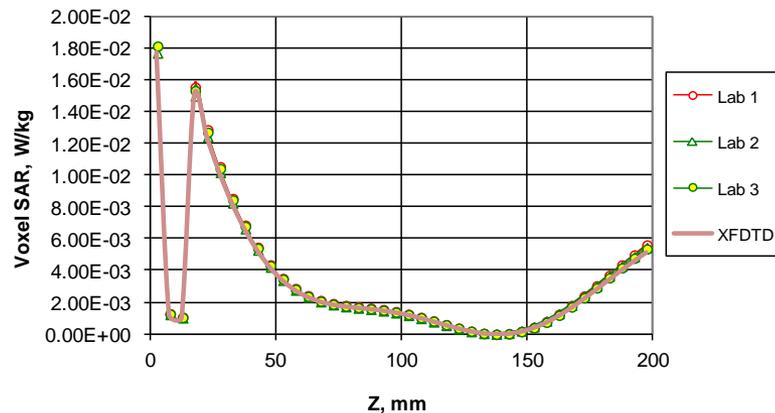
Reported results to compare include:

Voxel SAR and 1-g SAR computed along the lines:

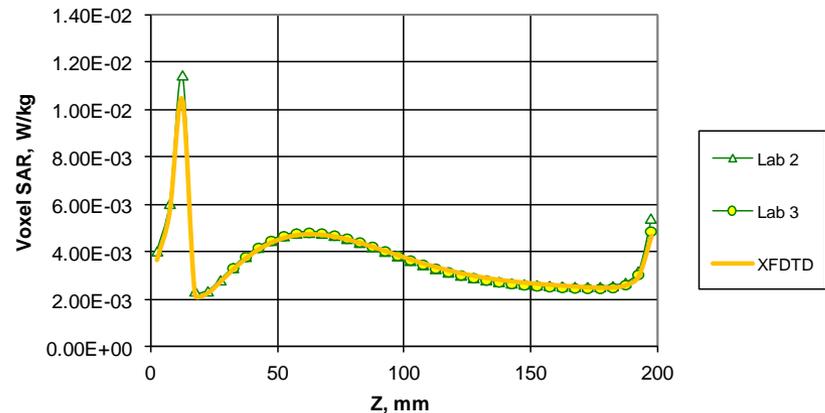
- 1) $x=0$; $y=0$; $0 < z < 200$
- 2) $x=0$; $y=300$; $0 < z < 200$
- 3) $x=200$; $y=0$; $0 < z < 200$

Comparing voxel SAR

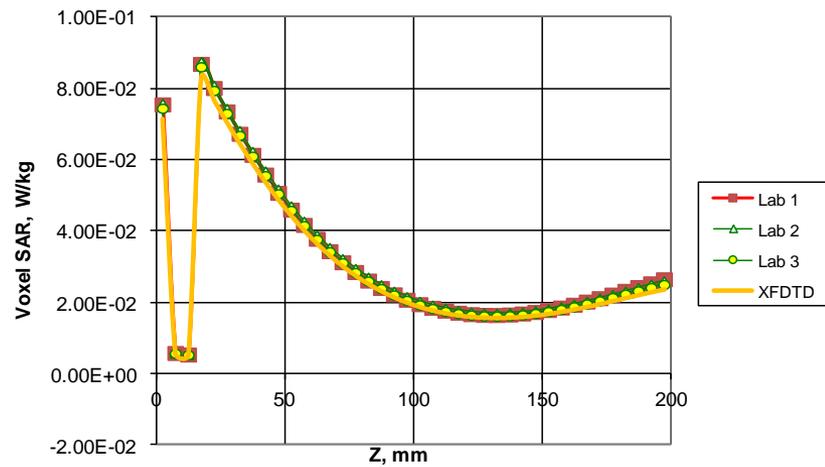
Voxel SAR, X=0, Y=0 Layered



Voxel SAR, X=0, Y=300 Layered



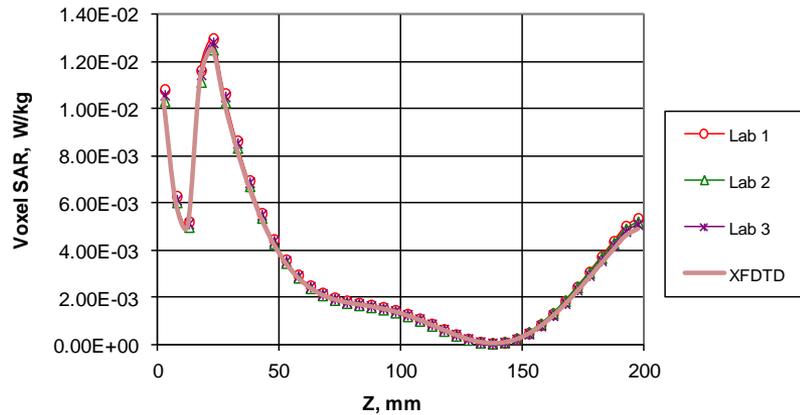
Voxel SAR, X=200, Y=0 Layered



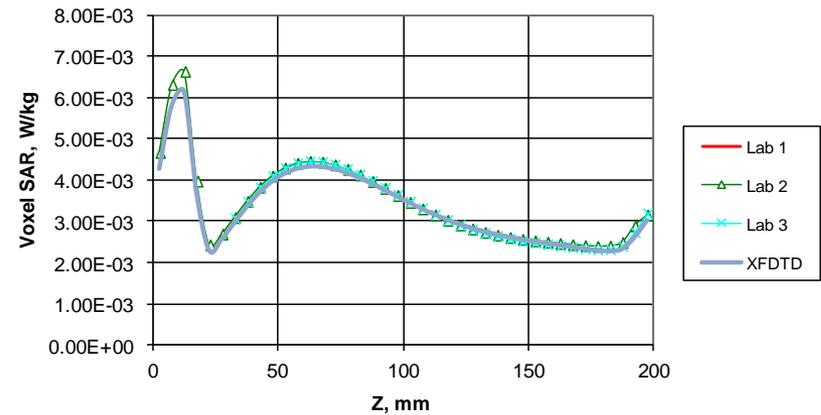
Note: Different Labs employed different simulation codes

Comparing 1-g SAR

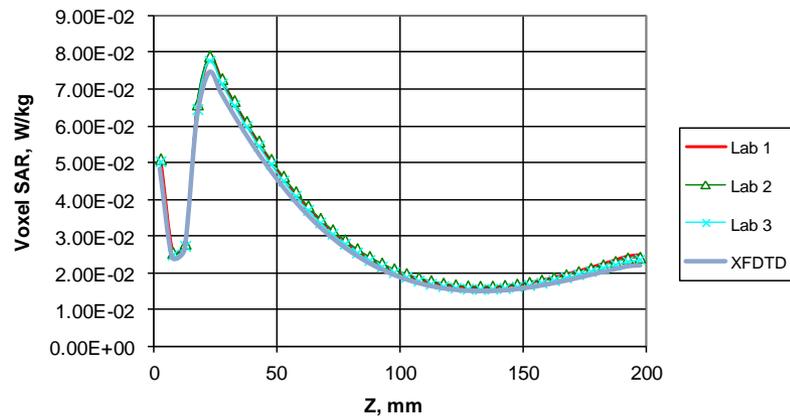
1g SAR, X=0, Y=0 Layered



1g SAR, X=0, Y=300 Layered



1g SAR, X=200, Y=0 Layered



Note: Different Labs employed different simulation codes