World Academy of Science, Engineering and Technology
International Journal of Physical and Mathematical Sciences
Vol:8, No:11, 2014

Durable Phantom Production Identical to Breast Tissue for Use in Breast Cancer Detection Research Studies

Authors : Hayrettin Eroglu, Adem Kara

Abstract : Recently there has been significant attention given to imaging of the biological tissues via microwave imaging techniques. In this study, a phantom for the test and calibration of Microwave imaging used in detecting unhealthy breast structure or tumors was produced by using sol gel method. The liquid and gel phantoms being used nowadays are not durable due to evaporation and their organic ingredients, hence a new design was proposed. This phantom was fabricated from materials that were widely available (water, salt, gelatin, and glycerol) and was easy to make. This phantom was aimed to be better from the ones already proposed in the literature in terms of its durability and stability. S Parameters of phantom was measured with 1-18 GHz Probe Kit and permittivity was calculated via Debye method in “85070” commercial software. One, three, and five-week measurements were taken for this phantom. Finally, it was verified that measurement results were very close to the real biological tissue measurement results.

Keywords : phantom, breast tissue, cancer, microwave imaging
Conference Title : ICMCC 2014 : International Conference on Mathematical and Computational Chemistry
Conference Location : Venice, Italy
Conference Dates : November 13-14, 2014