

Three dimensions localization of tumors in confocal microwave imaging for breast cancer detection

ABSTRACT

Basis of the microwave imaging is the contrast in dielectric properties of breast normal tissue and tumor. Confocal microwave imaging involves transmitting an ultrawideband signal through number of antennas and records the scattered signals. Then by synthetically focusing reflections from the breast, we can make image from breast. In this article, we demonstrate the feasibility of detecting 10- and 5-mm tumors in three dimensions with different antenna arrangements with different number of antennas. Two models of hemispherical array are presented. An image formation algorithm is presented for 3D image making. Successful detection of 10- and 5-mm tumors are achieved with the hemispherical arrangement. The influences of the different breast sizes for tumor detection are also explored.

Keyword: Cancer; Image reconstruction; Microwave imaging; Object detection