

Effectiveness of microwave technique in early detection of breast abnormalities

ABSTRACT

In this paper, a breast phantom of CIRS Model 010A contains various known masses and sizes is studied. A measurement of S11 signals is taken at few locations on a breast surface using an open-ended coaxial probe. The obtained signals permit the extraction of the dielectric property of the masses. The result has shown that the smallest size detected through this probe is approximately 0.20 mm, small enough to be detected at early stage breast abnormality growth. This method undoubtedly recognizes the presence and location of possible abnormalities such as benign and malignant tissues. Although the model does not contain malignant tissues, this study demonstrates the viability of detecting small breast tumors using this approach. Index Terms - Breast abnormalities, dielectric properties, microwave technique, open-ended coaxial probe.

Keyword: Breast abnormalities; Dielectric properties; Microwave technique; Open-ended coaxial probe