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# A Feasibility Study of Elastography Based Confocal Microwave Imaging Technique for Breast Cancer Detection

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## Abstract

Breast cancer is a common cancer type in women and its death rate is second highest among different kind of cancers. Early detection is an efficient way for curing and recovery. Confocal microwave imaging (CMI) using electromagnetic method for detection of breast cancer can avoid ionization caused by mammography. CMI uses the contrast of electrical properties between tumor and normal breast tissue to identify the existence and location of the tumor. However, new research result shows that gland and tumor have similar dielectric constant and electrical conductivity, so it is hard to distinguish gland and tumor. This paper proposes a new method based on elastography for the tumor identification. The high Young's modulus contrast of the two tissues resulting in different level of deformation by compression will provide sufficient features to discriminate whether the reflected signal is belonged to gland or tumor. Finite-difference time-domain (FDTD) method was used in simulation. Some examples were presented to validate the identification.

*Keywords:* microwave imaging, breast cancer, detection, Young's modulus, compression, identification

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