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Tissues permittivity imaging: Near-field microwave tomographic image for breast tumor visualization

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Different breast tissue with different dielectric properties, especially for the Permittivity of cancerous tissue is much higher than that of normal tissue. On the high dielectric constant of cancerous tissue boundary, in which it will be generated the microwave backscattering phenomena. Breast tumor microwave sensor system *BRATUMASS* obtains the maximum reflection wave signals of breast tumor through the method of slot step frequency modulate system which uses on image radar system Similar to the frequency modulation interrupted continuous-wave system. In mammo-sounding space, microwave propagation path between transmit wave and reflected wave can be calculated by frequency property parameters output from down converter with zero intermediate frequency signal. Dielectric properties of relevant breast tissue are inverted by energy distribution of the frequency output with zero intermediate frequency signals. We use Fourier diffraction and sagittal iterative reconstruction algorithm to reconstruct microwave tomographic image and determine the location of tumor. And confirm the feasibility of breast tumor microwave sensor system by medical clinical cases experiment.

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