A feasible novel technique for breast cancer imaging using UWB-microwave antennas

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Microwave Imaging (MI) is an emerging non-invasive and non-ionizing technique for breast cancer diagnosis based on microwave backscattered by breast tissues. Dielectric properties of cancerous tissues are considerably high compare to the normal tissues therefore the backscattered rays of tissues analyzed and locate using inverse image reconstruction algorithm. The motivation of this work is early detection of breast cancer and for more precise results with low expenses. Due to low contrast of image by x-ray mammography, age group restriction and false result ratio, it's hard to say that Mammography is beneficial or harmful. Another fact about mammography is a painful process of analysis, therefore, we must develope some method which is user friendly i.e., for patients. This work presents initial results of simulation and design of a hard and flexible antennas ranging between 0.001 GHz to 3 GHz for *in vitro* experimentation. Basically the Microstrip Patch antennas of two different shapes were simulated and fabricated in this first step with different materials like FR4, Cotton cloth, Polyester and Kapton Polyimide (for Flexible antennas). The size of antenna depends on permittivity of substrate material and resonance frequency. To analyze the design and scattering parameters of antennas High Frequency Simulation Software (HFSS) used for different materials of substrate. Antennas are tested using mimic-phantoms of breast. The simulation results of rectangular patch and circular slot antennas show a peak of microwave emission / detection at 2 GHz and 300 MHz band width

Speaker Biography

Maryam Liaqat did her Master's in Physics in 2013 from University of Agriculture, Pakistan. Currently, she is perusing PhD in Electrical Engineering from Federal University of Pernambuco, Brazil. She is working on project of microwave antenna modifications for the detection of breast cancer. Designing flexible antennas for microwave imaging system, which will be user friendly, cost effective and more precise in results as compared to x-ray mammography.

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