

Umbria Bioengineering Technology Srl -UBT

Revolutionary mammographic system by using low-power microwaves

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MammoWave® is a revolutionary system providing mammographic analysis, using completely safe low-power microwaves, providing patient friendly safe diagnosis (no compression of the breast), providing superior diagnostic outcomes (neglectable level of false positives) that are tissue (and therefore age) independent. And all of this against decreased costs (Lower system costs, shorter time to result, no special operator training needed).

The system consists of an examination bed that incorporates a plexiglass cup to contain the breast of the patient (facing down). Antennas operating in the microwave band irradiate the breast with low power (1mW) microwaves and capture the electromagnetic fields scattered by the breast from different angles. A proprietary software elaborates the information into images, and through a dedicated AI-powered algorithm highlights the tissues' inhomogeneity in the breast image to identify cancerous tissue and assist in breast screening.

The use of safe low power microwaves to obtain images. Our patented microwave-based imaging technology is based on the exploitation of the dielectric properties of human tissue and the fact that normal and malignant tissues differentially scatter an electromagnetic field.

MammoWave® software is built around a novel, fast, and accurate imaging algorithm based on the Huygens Principle. This eliminates iterative and time consuming processes, typical for microwave tomography imaging devices. The software renders an intensity map representing dielectric homogeneity of breast tissues.

An image analysis algorithm calculates some parameters such as the ratio between the maximum and the average intensity (Max/Avg) to identify suspected lesions. AI is applied to both raw-data and microwave images to allow automated distinction between breasts with no radiological finding (NF) and breasts with radiological findings (WF), i.e. with lesions that may be benign or malignant.

Literature and scientific papers

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