

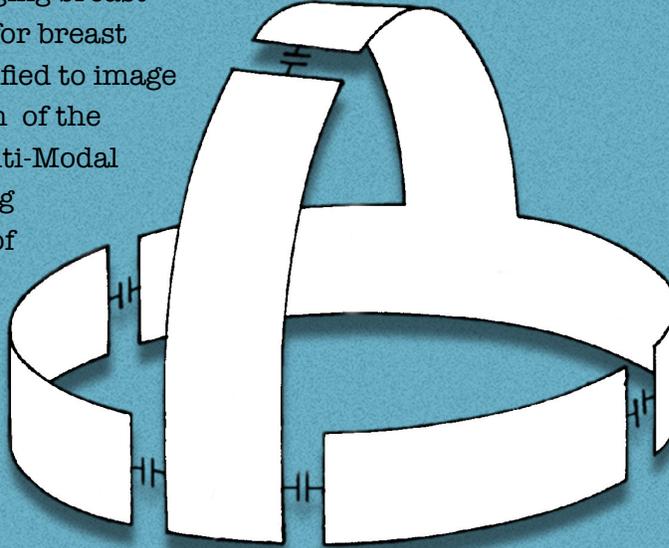
Multi-Modal RF Coil for MRI

Simple, early detection of breast cancer.

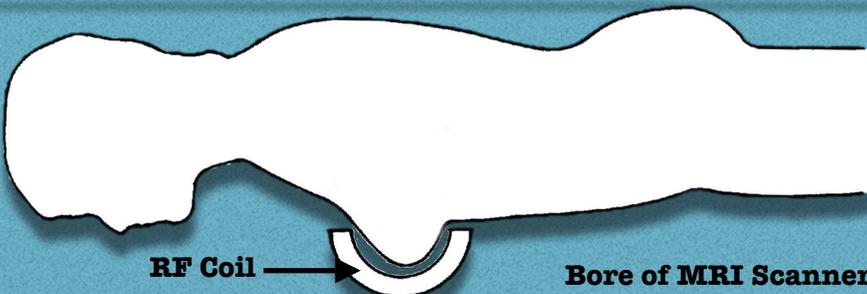
The Multi-Modal Radio Frequency (RF) Coil for Magnetic Resonance Imaging (MRI) is a novel device that can be implemented into existing clinical MR scanners at 1.5T and 3T to more accurately image small regions of interest. This design is

made specifically for imaging breast tissue in order to screen for breast cancer, but it can be modified to image any other localized region of the human anatomy. The Multi-Modal RF Coil for breast imaging utilizes an arrangement of microstrip conductors comprising an arcuate strap connected to a base ring configured to the shape of the female breast (or other region of interest). The

segmented base ring and strap are interconnected with capacitors that are tuned to the proton resonance frequency of the particular clinical MR scanner. The coil has two modes: the first mode involves no current flow through the strap, while a current is induced in the base ring that travels through the microstrip conductors in a circular path. In the second mode, there is a 90° phase shifted current induced in the strap, which is divided symmetrically in the base ring. These modes are combined to produce high-resolution breast images. The design is flexible to accommodate additional straps for higher-modal operation. In general, two RF coils are simultaneously utilized to enable bi-lateral breast imaging of the female patient.



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Benefits

- Creates detailed images of small regions of interest in the human anatomy
- Allows for early detection of cancer, particularly breast cancer
- Can be used with existing MRI equipment
- Two RF coils are typically configured for bi-lateral imaging

Features

- Arcuate strap connected to a base ring for an anatomically correct RF receive coil that can be installed in conventional clinical MR scanners
- Tunable for operation at 1.5T proton resonance (64 MHz) and 3.0T proton resonance (128 MHz) Expandable to multiple straps for higher order modal operation.

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