Parametric Ultrasound Imaging by Using Angular Compounding to Reduce Statistical Variability

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Technology description

Ultrasound scanners transmit an ultrasonic signal into a patient and then receive and analyze an echo signal from the patient’ s tissue. In conventional gray scale imaging, the most widely used mode, only the echo signal’ s amplitude is extracted and analyzed.
Parametric ultrasound imaging, on the other hand, extracts additional echo signal frequency and/or phase information, and processes it to reveal tissue microstructure and disease properties not seen with conventional ultrasound imaging. Parametric measurements, however, exhibit significant statistical variability. To reduce variability, measurements from several tissue locations must be averaged, compromising spatial resolution and limiting the practical value of this technique. UW-Madison researchers have developed a method of significantly reducing the statistical variability inherent in parametric ultrasound imaging by employing a multiple angle (angular compounding) acquisition strategy that has recently become available on ultrasound scanners. Rather than sweeping parallel or quasi-parallel beams over a scanned region as in traditional ultrasound, this technique interrogates a scanned volume with beams traveling at various directions from the scanner transducer’ s surface. Multiple echo signals at various angles are then acquired from the same tissue volume. These statistically independent measurements are then averaged to provide the parametric measurement of interest.
The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method of significantly reducing the statistical variability inherent in parametric ultrasound imaging.

Application area

Parametric ultrasound imaging

Advantages

Controls measurement variability and increases spatial resolution in parametric ultrasound imaging
Promises to make parametric image quality competitive with that of conventional approaches
Can be implemented without fundamental modifications to existing ultrasound instruments

Institution

Wisconsin Alumni Research Foundation

Inventors

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