

ACOUSTICS2008/2305 Micromachined probe performance assessment

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In recent years, (Capacitive Micromachined Ultrasound Transducer) CMUT technology was widely investigated and functional prototypes have been released by several R&D teams. CMUT technology offers outstanding characteristics in acoustic, interconnect packaging capabilities or in integration features that are exciting criteria for new medical applications.

We propose a full acoustic characterization report of a CMUT probe. A linear array was fully packaged with electronic preamplifier boards integrated. A complete acoustic characterization of the probe is then performed and presented. In a second phase, a linear probe with piezocomposite technology is realized. The conception is done in regard to the geometric characteristics and to the acoustic response of the micromachined probe. Then an electro-acoustical benchmark CMUT / piezocomposite is realized in the closest conditions.

Using a commercial ultrasound imaging platform, an image assessment is performed. The images are first analysed in a quantitative way with a tissue mimicking phantom, using a computerized tool who considered imaging parameters such as contrast, resolution or signal to noise ratio. In a second way, a clinical perspective is discussed with in vivo images.