Acoustical cross-talk in row–column addressed 2-D transducer arrays for ultrasound imaging

The acoustical cross-talk in row–column addressed 2-D transducer arrays for volumetric ultrasound imaging is investigated. Experimental results from a 2.7 MHz, λ/2-pitch capacitive micromachined ultrasonic transducer (CMUT) array with 62 rows and 62 columns are presented and analyzed in the frequency-wavenumber domain. The sources of cross-talk are identified and predicted theoretically. The nearest neighbor cross-talk is 23.9±3.7 dB when the array is used as a 1-D array with the rows functioning as both transmitters and receivers. In the row–column configuration, with the columns transmitting and the rows receiving, the cross-talk is reduced to 40.2±3.5 dB.