



Rev. Sci. Instrum. **62**, 203 (1991); doi:10.1063/1.1142306 (5 pages)

Piezoelectric copolymer hydrophones for ultrasonic field characterization

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(Received 14 June 1990; accepted 24 September 1990)

Hydrophones to be used in the characterization of medical ultrasonic transducers have been fabricated using a new polyvinylidene fluoride/trifluoroethylene (VF₂/VF₃) copolymer. The copolymer has an advantage over VF₂ in that it does not require prestretching before poling. Thin copolymer films can be cast from solution and then poled using the corona discharge method. As there is a need for small - diameter hydrophones to provide good spatial resolution in measuring highly focused ultrasonic beams, hydrophones with diameter as small as 0.1 mm have been made. Both needle - type and line hydrophones have been tested and their performance reported. In the case of line hydrophones, the output signal is proportional to the line integral of the acoustic pressure and a computer tomographic technique has been used to reconstruct the beam profiles.