

H. B. Nemade, T. Anjaneyulu, P. C. Pandey, Sensing turbulence transit time by pulsed ultrasound for single-phase fluid flow measurement, IEEE Trans. Instrumentation and Measurement, 47(1), pp. 265 - 269, 1998

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***Abstract* - A new technique for sensing turbulence in singlephase fluid flow by pulsed ultrasound is developed. The velocity component of turbulence perpendicular to the flow axis is sensed by two ultrasonic transducers mounted diametrically opposite on the pipe. The technique facilitates detecting variations in time of flight of two ultrasonic pulses transmitted simultaneously in the opposite directions and perpendicular to the flow axis. The flow velocity is obtained from the position of the peak in the cross correlation function of the turbulence signals sensed at two locations on the pipe. A numerical simulation of the technique based on a theoretical model has been carried out. The technique has been implemented to measure volumetric flow noninvasively in a water circulation system with PVC pipes.**