Characterization of an ultrasound reception chain based of a PVDF membrane hydrophone

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Abstract : Ultrasound is commonly used in different applications such as the defects detection in materials, underwater detection, medical and biological applications. In all this applications, it is necessary to have a system allowing the emission of ultrasonic waves and their reception. In general, this system is essentially composed of an electric generator, a transmitter transducer, a receiver transducer and a display or recording system. The purpose of this work is the functioning characterization of a measurement chain comprising a receiver transducer with PVDF membrane connected by means of a coaxial cable to an oscilloscope. This theoretical model proposed, allows the determination of the impulse response in the temporal domain or the transfer function in the frequency domain of the entire reception measurement chain. In this study, special attention is given to the receiving transducer as the main element of the receiving chain.

Keywords : PVDF membrane, ultrasound reception chain, transfer function, impulse response, transfer Matrix