

Accurate simulator of an acoustooptical system

Antonio F. Guisado, Amador M. González, José A. Pérez

Universidad Politécnica de Madrid - SPAIN

Abstract

In this work, we present a comparative study of the experimental and simulation procedures to measure the velocity of sound in the different media composing an acoustooptical system. The simulation is based on the use of a circuital model for a PZT piezoceramic-based generator and on the line transmission analysis to simulate the propagation of the acoustical wave. We aim at design the most accurate simulator to develop the best theoretical model in order to describe the physical phenomena. The experimental system consists of a laser interferometer that determines the velocities of sound in different fluid media. In the simulation, we use different transmission lines, each one corresponding to a given section (medium) of the system. The circuital model we use to simulate the piezoceramic device is based on that proposed by Leach, but we incorporate the required treatment for the mechanical losses by means of the lossy transmission lines, as we have done in previous works.