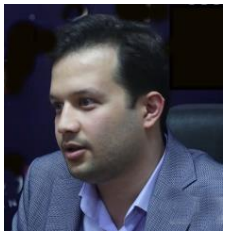
20th Khwarizmi Youth Award

Third Laureate Applied Research



Researcher: Seyed Foad Mousavi

Project Title: Design and fabrication of ultrasonic transducer for gas ultrasonic meter

Collaborator: Seyed Hassan Hashemabadi

Advisory Professors: Jalil Jamali, Hossein Azizi moghaddam

Collaborator Organization: Iran University of Science and Technology (IUST), Flow Measurement Institute, Iran CFD Specialty Center, Artiman Co., Iran Gas Transmission Co.

Field: Mechanics

Abstract:

Today, one of the biggest challenges in various industries is precisely measurement of the various parameters of the pipe flows, such as flow rate, which are economically and legally influential. For flow measurement, one solution is to use ultrasonic flowmeters. In addition to their many benefits, such as the lack of pressure effect, the lack of moving parts and the low maintenance cost, they are a good solution to increase the accuracy by less than 5%. In general, ultrasonic flow meters consist of three main parts, the SPU (Signal processing Unit), the spool (or mechanical body) and the ultrasonic transducers. The SPU performs the task of calculating, calibrating, and processing the signals as well as the calculations. Moreover, the spool is the main body of the meter. However, the most important part and, in other words, the heart of an ultrasonic flowmeter are its ultrasonic transducers. In this project, ultrasonic transducers are designed and fabricated for the first time in the country for use in the ultrasonic gas meter, with all the requirements for working in the explosive gas environment. In addition, software has been developed to design and simulate the performance of the transducers, which can also be used for other applications.