Special Issue

Ultrasonic Transducers for High Temperature Applications

Message from the Guest Editor

Ultrasonic transducers play a key role in a number of strategically important fields in health monitoring and nondestructive testing. Applications that use ultrasonic transducers include the medical, aerospace, railroad, marine, and energy-related industries. The heart of an ultrasonic transducer is the piezoelectric element. Transducers currently used in these industries primarily employ PZT5-H as the piezoelectric element for ultrasound transmission and detection. This material has a Curie–Weiss temperature that limits its use to about 210 °C. Some industrial applications require much higher temperatures, i.e., 350–1000 °C, heat engines, steam generators, heat exchangers, steam pipes, deep geological exploration, etc. The goal of this issue is to survey and review piezoelectric elements for use in high-temperature environments for the ultimate purpose of structural health monitoring (SHM), non-destructive evaluation (NDE), and material characterization (NDMC). The survey comprises the following categories:1. High-temperature applications with single crystals; 2. Thick-film ceramics, and composite ceramics; 3. Sol–gel and spray-on transducers.

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Sensors is a leading journal devoted to fast publication of the latest achievements of technological developments and scientific research in the huge area of physical, chemical and biochemical sensors, including remote sensing and sensor networks. Both experimental and theoretical papers are published, including all aspects of sensor design, technology, proof of concept and application. Sensors organizes Special Issues devoted to specific sensing areas and applications each year.

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