



sensors

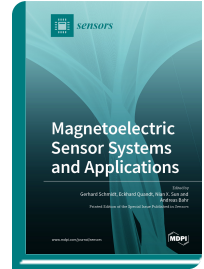


Special Issue Reprint

Magnetolectric Sensor Systems and Applications

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In the field of magnetic sensing, a wide variety of different magnetometer and gradiometer sensor types, as well as the corresponding read-out concepts, are available. Well-established sensor concepts such as Hall sensors and magnetoresistive sensors based on giant magnetoresistances (and many more) have been researched for decades. The development of these types of sensors has reached maturity in many aspects (e.g., performance metrics, reliability, and physical understanding), and these types of sensors are established in a large variety of industrial applications. Magnetic sensors based on the magnetolectric effect are a relatively new type of magnetic sensor. The potential of magnetolectric sensors has not yet been fully investigated. Especially in biomedical applications, magnetolectric sensors show several advantages compared to other concepts for their ability, for example, to operate in magnetically unshielded environments and the absence of required cooling or heating systems. In recent years, research has focused on understanding the different aspects influencing the performance of magnetolectric sensors. At Kiel University, Germany, the Collaborative Research Center 1261 “Magnetolectric Sensors: From Composite Materials to Biomagnetic Diagnostics”, funded by the German Research Foundation, has dedicated its work to establishing a fundamental understanding of magnetolectric sensors and their performance parameters, pushing the performance of magnetolectric sensors to the limits and establishing full magnetolectric sensor systems in biological and clinical practice.



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