Special Issue

Frequency Mixing Magnetic Detection of Magnetic Nanoparticles

Message from the Guest Editors

Frequency mixing magnetic detection (FMMD) has been well-established for more than 15 years as a sensitive and very selective technique to quantitatively probe magnetic nanoparticles by their nonlinear responses to a two-frequency magnetic excitation field. The method has been applied for numerous magnetic immunoassays of different biological targets, with better sensitivities and detection ranges than the standard enzyme-linked immuno sorbent assay (ELISA) techniques. In this Special Issue, the fundamentals of FMMD methodology will be comprehensively explained, the design and realization of FMMD instrumentation will be presented; and various FMMD applications from the fields of biomedicine, nanomaterials characterization and even the non-destructive evaluation of fatigue will be highlighted. In particular it will present how offset field scanning is employed to determine the core size distribution of magnetic particles; a phase evaluation allows for the assessment of the Brownian relaxation, yielding information on the binding state of magnetic particles to biological targets; FMMD has been applied as a detection modality for magnetic particle imaging (MPI).

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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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