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JOHANNES GUTENBERG
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Physikalisches Kolloquium

July 11, 2023 at 4:15 p.m.
HS KPH

Prof. Susana Cardoso de Freitas
INESC MN University of Lisboa - Portugal

Magnetic sensors: from ultrathin film growth to sensor integration in unexpected systems

Magnetic field sensors have a mature and transversal level of implementation in the market, from automotive to biomedical domains. The impressive technological progress in thin film preparation and characterization, combined with nano-microfabrication tools offer presently large spectra for device design. The materials discussed include several varieties of thin film materials combined onto multilayer stacks. In addition, the noise mechanisms (the “killing factor” that limits the MR sensor performance) will be discussed, and I will show successful strategies for improving the signal-to-noise ratio, improving the ultimate field detectable by an MR sensor.

Examples where spintronic sensors are useful tools for precision sensing will be provided, including integration with microfluidics, optical and MEMS micromachined actuators. During my talk, I will show how challenging applications have identified creative solutions, requiring joint skills in transversal areas as physics, materials, electronics and mechanical engineering.

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