Special Issue

Nano and Micro Superconducting Quantum Interference Devices

Message from the Guest Editors

Superconducting quantum interference devices (SQUIDs) are among the most sensitive detectors of magnetic flux available, having at the same time high versatility. Being a flux to voltage converter, the SQUID can measure all physical quantities that can be converted into magnetic flux, for example, magnetic field, magnetic field gradients, current, voltage, displacement, or magnetic susceptibility. The SQUID exhibits an equivalent energy sensitivity that approaches the quantum limit; therefore, it is often employed in very interesting experiments of basic physics, including the detection of Hawking radiation, the dynamical Casimir effect, the Majorana fermions investigations, the effects of the quantum gravity, and detection gravitational waves. Thanks to their very high performance together with their robustness and reliability, SQUID-based devices are widely used in several applications, such as biomagnetism, magnetic microscopy, non-destructive evaluation, geophysics, astrophysics, quantum information, and particle physics.

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