MATTER AND TECHNOLOGIES

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Superconducting quantum sensors –enabling technology for next-generation physics experiments

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Progress in the understanding of nature often goes hand in hand with advances in physical instrumentation. For this reason, huge R&D efforts are taken to push detector technology beyond the present state of the art and to challenge physical and technological limitations. Within this context, superconducting quantum sensors represent a still rather new class of detectors that for selected applications outperform conventional detector technology by several orders of magnitude and that allows performing precision experiments that were considered impossible in the past. This talk first shortly reviews the concept and underlying physics of superconducting sensors and discusses the origin of the outstanding performance. Afterwards, we highlight example present and future applications that already and will potentially strongly benefit from the usage of superconducting quantum sensors. These include, for example, spectroscopy at brilliant light sources, searches for dark matter or material science with unprecedented possibilities. We also outline the role of the program MT for the journey ahead.

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