

SQUID Fundamentals and Applications

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Since the first Superconducting Quantum Interference Device (SQUID) became commercially available nearly 40 years ago, SQUID sensors have enabled the development of an exceedingly broad range of applications in very diverse fields, including laboratory and scientific instrumentation for basic research, biomedical imaging (magnetoencephalography and magnetocardiography), non-destructive testing (magnetic microscopy, X-ray microanalysis), and geophysics (oil and mineral exploration). The development of these applications has spawned commercial successes and worldwide revenues of nearly one billion U.S. dollars.

This presentation reviews the fundamentals of basic SQUID design and operation, current state-of-the-art production processes for the fabrication of SQUID sensors based on low-temperature and high-temperature superconductors, and new and emerging applications under development at research institutions and corporate laboratories. Also reviewed is the current commercial landscape, along with a discussion of the commercial outlook for SQUIDs and SQUID-based systems.