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Current status and prospects of solid-state quantum sensors for Quantum-LEAP

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Abstract

Solid-state quantum sensors using diamond and SiC are expected to have various applications due to their principle possibilities such as wide-field dynamic range, operating temperature range, and high spatial resolution down to the atomic level.

In the MEXT Q-LEAP Quantum Solid-state Flagship Project, five companies, five academia, and two national research institutes have teamed up to develop a solid-state quantum sensor from basic science and technologies such as materials and quantum protocols to sensor modules and application prototypes.

In this talk, I would like to introduce the latest research topics of Q-LEAP, such as high precision simultaneous measurement of current and temperature in EV batteries, high-resolution magnetocardiographic imaging of rats, probing into living cells by tip-type NV sensor. In addition, expectations for a future "quantum leap" society based on quantum solid-state sensor technology will be discussed.

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