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Electron spins in a 2D system investigated by nuclear spins

- Unfrozen collective fluctuations -

Motivation

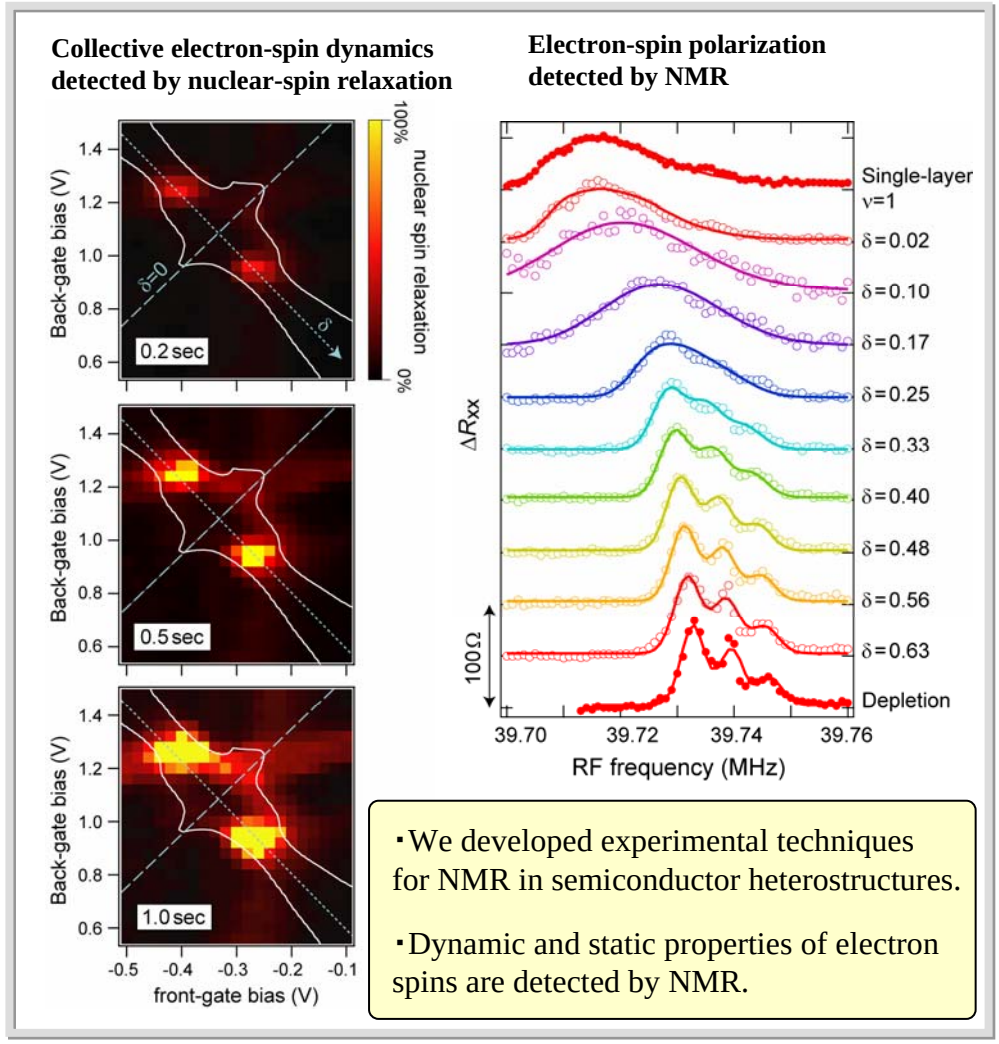
In semiconductor heterostructures, clean two-dimensional (2D) planes with atomic-scale flatness can be formed. Such a system can be an ideal laboratory to study low-dimensional physics. Our aim is to find new physics and control collective phenomena in the system.

Originality

We developed experimental techniques for nuclear magnetic resonance (NMR) in semiconductor low-dimensional systems to investigate static and dynamic properties of electron spins. The measurement detects collective electron spin dynamics at low temperature limit in a two-dimensional system.

Impact

NMR detection of electron spin properties in semiconductor heterostructures has uncovered new physics in low dimensions. Furthermore, addition of the nuclear spin degree of freedom to electronics opens up possibilities for developing new device concepts.



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