

Quantitative Study of Magnetic Field from magnetic Domains with a single photon emitters.

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Resumen

The recent race to develop new and better technologies requires knowing the behavior of magnetic materials at the nanoscale. The measurement challenge is quite varied, and most techniques to study magnetic properties bring a qualitative idea of its behavior but not quantitative at the nanoscale. In this regard, the Nitrogen-Vacancy center (NV-center) in diamond is a great candidate to perform high sensitivity and high spatial resolution magnetic sensing due to the high level of control that is possible to achieve of their spin and electronic degree of freedom. The NV-center behavior is encoded in the photoluminescence emission like a single spin and the spin state. Zeeman shift allows measuring the magnetic field's projection along the NV axis. This technique can be used as a powerful tool to tackle fundamental problems in nanomagnetism. This work introduces an alternative to knowing the quantitative local behavior of the magnetic domains, in a magnetic material, in the presence of an external magnetic field. A ferrimagnetic insulator yttrium iron garnet (YIG), one of the extensively researched materials due to its small magnetic damping, is measured in this work with an NV center.

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Referencias

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