Diamond defects: Sensitive probes for their magnetic and electric environment

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Sensitive, point-like probes of electric and magnetic fields are of potential use in a variety of areas in science. Traditional methods comprise scanning probe like methods, e.g. tunneling or force microscopy in addition to SQUID and atom vapor based methods. Diamond defects are a new addition to the family of potentially useful methods. They are point-like sensors since single impurity atoms can be read out. Additionally favorable relaxation parameters result in an exquisite sensitivity well below nT/√(Hz) for magnetic and few tens of V/cm for electric fields. The talk will highlight recent results on how to achieve improved sensitivity and detection of small magnetic moments with this technique.