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(POS-42) Measurements of various magnetic field strengths using an NV centers in Diamond

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 $\rm NV^-$ centers have a renowned interest in geophysical sciences due to their unique spin state manipulation in the presence of external stimuli. One of the well-studied effects from the NV center spin state is its change in luminescence intensity when in the presence of a magnetic field. This effect has been used to demonstrate the creation of various types of $\rm NV^-$ center magnetometers. Our research demonstrates the different effects $\rm NV^-$ center diamond crystal produces in the presence of a magnetic field when optically pumped with a 532 nm laser. We have demonstrated a change in luminescence intensity when in the presence of fields T > 1 mT without the usage of microwave resonance about 2.87 gHz typically used for nano-Tesla magnetic field detection with NV centers. Comments on the creation and measurement using NV centers are noted. Some experimental details on manipulation of the spin state are other experiments included in this presentation, as well as results on creation of a solid state qubit and other quantum processes that can be created using this qubit.

Keyword-1

magnetometry

Keyword-2

diamond

Keyword-3

optics

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