



Quantum Sensing by Diamond Magnetometer



The grey curve shows the decrease of fluorescence at the resonance frequency. The $m_s = \pm 1$ ground level of the NV center splits up by applying a magnetic field (blue). The resonance frequencies shift linearly with the strength of the magnetic field.

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This quantum diamond magnetometer and its experiments will introduce students to the concepts of quantum sensing. The design of the **quNV** is based on recent achievements of scientific research and demonstrates quantum sensing in a simple and user friendly system for student lab courses at colleges and universities.

The core of the **quNV** is a HPHT diamond with a nitrogen vacancy (NV) center. The NV center can be excited by light in the green spectrum. The excited state decays back to the ground state either directly or via an intermediate

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The electron spin can be manipulated further by microwave radiation. By applying magnetic and electric fields, the energy levels of the spins can be shifted. Hence, a vast amount of experiments and measurement applications are possible.

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