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[403] Photophysics of single NV centers in diamond and its application to electric field detection at cryogenic temperatures

Tuesday 5 September 2023 14:45 (15 minutes)

We present the strain and magnetic field dependent photophysics of individual Nitrogen-Vacancy (NV) color centers in diamond from cryogenic to ambient conditions. Our experimental results and matching model predictions offer new insights into the structure of the NVs' excited states and its significant effect on the optical spin contrast, which directly relates to the performance of NV centers as quantum sensors. Based on the high sensitivity of the NV's orbital excited states to electric fields, we present a study of charge dynamics in the diamond host as well as a low-temperature, all optical electromagnetic field sensing scheme.

Theoretical Work

Authors: HAPPACHER, Jodok (University of Basel); BOCQUEL, Juanita (University of Basel); MALETINSKY, Patrick (University of Basel)

Presenter: HAPPACHER, Jodok (University of Basel)

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