

PHYSICAL COLLOQUIUM

INVITATION

Monday, 24.01.2022, 4.15 p.m.,
video conference: <https://meeting.uol.de/b/anj-2vc-j6s-fwe>

speaks

Prof. Dr. Vladimir Dyakonov,
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about

"Coherent Control of Spin Defects in van der Waals Materials"

Van der Waals (vdW) materials have emerged over the last decade as the new playground for quantum photonics devices. Among them, hexagonal boron nitride (hBN) is an interesting candidate, mainly because of its crystallographic compatibility with many different 2D materials, but also because of its ability to host optically active spin defects. We have recently reported [1] the optically detected magnetic resonance of spin-triplet negatively charged boron vacancies (VB⁻) in hBN and determined their spin-Hamiltonian parameters. Furthermore, we demonstrated the coherent control of VB⁻ at room temperature and determined the relevant spin-coherence times. [2]

In this respect, sensors based on such color centers embedded in an intercalated hBN layer within a vdW heterostructure may be particularly attractive, since the distance between the sensor and the object to be sensed can be quite small. The influence of external stimuli (magnetic field, temperature, pressure, etc.) on this spin defect will be also discussed. [3]

[1] A. Gottscholl, M. Kianinia, V. Soltamov, C. Bradac, C. Kasper, K. Krambrock, A. Sperlich, M. Toth, I. Aharonovich, and V. Dyakonov, Nat. Mater. 19, 540 (2020)

[2] A. Gottscholl, M. Diez, V. Soltamov, C. Kasper, A. Sperlich, M. Kianinia, C. Bradac, I. Aharonovich and V. Dyakonov, Science Adv., 7, eabf3630 (2021)

[3] A. Gottscholl, M. Diez, V. Soltamov, C. Kasper, D. Krauß, A. Sperlich, M. Kianinia, C. Bradac, I. Aharonovich, and V. Dyakonov, Nat. Commun. 12, 4480 (2021)

All interested persons are cordially invited.

Sgd. Prof. Dr. Christian Schneider