

FNM 2016 Program Committee cordially invites people to submit abstracts for The International Workshop on Functional and Nanostructured Materials to be held in Tbilisi, Georgia 6th -10th September 2016.

Optical properties of semiconducting 2D materials

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Atomically-thin layers of semiconducting transition metal dichalcogenides (S-TMDs) represent a new class of two-dimensional systems which are interesting from the viewpoint of their fundamental electronic properties (unusual band structure, unconventional excitons) and possible optoelectronic applications (light emitting- and photo-diodes). The summary of our recent works on mono- and multi-layers of WSe₂-, MoSe₂-, and WS₂-compounds will be presented. Optical response (excitonic resonances) of these 2D materials will be first discussed in dependence of the number of layers and as a function of temperature. Next, the magneto-optical response (reflectance and luminescence spectra) of the WSe₂ and MoSe₂ monolayers will be compared in reference to the distinct alignment of the spin-orbit split electronic subbands in each of these monolayers (bright- or dark-exciton ground state). Finally, the intriguing observation of single photon emitters associated to S-TMD monolayers will be presented and the possibility to modulate (increase) the polarisation degree of the emitted light with small magnetic fields applied in optical pumping experiments will be invoked

References

Excitonic resonances in thin films of WSe₂: from monolayer to bulk material

Ashish Arora, Maciej Koperski, Karol Nogajewski, Jacques Marcus, Clément Faugeras and Marek Potemski
Nanoscale 7, 10421 (2015).

Exciton band structure in layered MoSe₂: from a monolayer to the bulk limit

Ashish Arora, Karol Nogajewski, Maciej Molas, Maciej Koperski and Marek Potemski
Nanoscale 7, 20769 (2015).

Single photon emitters in exfoliated WSe₂ structures

M. Koperski, K. Nogajewski, A. Arora, V. Cherkez, P. Mallet, J.-Y. Veuille, J. Marcus, P. Kossacki, and M. Potemski
Nature Nanotechnology 10, 503 (2015).

Tuning valley polarization in a WSe₂ monolayer with a tiny magnetic field

T. Smoleński, M. Goryca, M. Koperski, C. Faugeras, T. Kazimierzczuk, K. Nogajewski, P. Kossacki, M. Potemski
Phys. Rev. X6, 021024, (2016).

Optical studies of tungsten disulphide: From monolayer via multilayers to bulk material

M.R. Molas et al., to be published.

Bright and dark excitons in transition metal dichalcogenides: High field magneto-optics of MoSe₂ and WSe₂ monolayers,

M. Koperski et al, to be published.

FNM 2016 aims to bring together physics, material science and engineering communities to present and discuss their work on fundamental physics and applications of functional nanoengineered materials.