Contribution ID: 8

Type: Invited talk

Probing and manipulating valley coherence of dark excitons in WSe₂ monolayer

Wednesday, 23 December 2020 09:00 (40 minutes)

Monolayers of semiconducting transition metal dichalcogenides are two-dimensional direct-gap systems that host tightly-bound excitons with an internal degree of freedom corresponding to the valley of the constituting carriers. Strong spin-orbit interaction and the resulting ordering of the spin-split subbands in the valence and conduction bands makes the lowest-lying excitons in WX₂ (X being S or Se) spin-forbidden and optically dark. This results in their long lifetime, making them potentially interesting for valleytronics. With polarizationresolved photoluminescence experiments performed on a WSe₂ monolayer encapsulated in a hexagonal boron nitride, we demonstrate how the intrinsic exchange interaction in combination with the applied in-plane and perpendicular magnetic fields enables one to probe and manipulate the valley degree of freedom of the dark excitons.

Primary author: Dr SLOBODENIUK, Artur (Charles University)Presenter: Dr SLOBODENIUK, Artur (Charles University)Session Classification: Condensed Matter Physics

Track Classification: Condensed Matter Physics