

DYNAMIC SCREENING OF QUASIPARTICLES IN WS_2 MONOLAYERS

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The low dimensional nature of TMDCs and the resulting reduced screening influence their nonequilibrium optical properties, as dynamic screening by photoexcited quasiparticles governs the transient response. Here, we investigate the respective roles of excitons and quasi-free carriers on the dynamic response of WS_2 monolayers on SiO_2 . We find drastic changes in the reflectivity/transmittance contrast upon photoexcitation. The main observation is a pump photon energy-dependent blue/red shifts of the neutral exciton. Based on a phenomenological model, we disentangle the different impact of excitons and free carriers on the renormalization of the quasi-free-particle band gap and exciton binding energy. This work unravels and quantifies the competition and interplay of the multiple electronic and thermal processes contributing to the recovery of the system upon photoexcitation.

Webinar

Venerdì 16 aprile 2021, ore 11.00

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