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95. Valley polarized magneto-optical absorption in MoS_2 quantum rings
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Due to direct optical transitions in spin-coupled K-valleys, photoluminescence (PL) and magneto-PL of monolayer molybdenum disulphide (MoS_2) demonstrate high valley polarization. Using MoS_2 quantum rings (QRs), we simultaneously explore the influence of magnetic field, field setup, spatial confinement and the Aharonov-Bohm (AB) quantum-interference effect. Our magneto-optical absorption spectra demonstrate that the optical valley selectivity observed in the monolayer MoS_2 is inherited to the QRs. Moreover, it is robust against variation of magnetic flux and of the QR-geometry. However, unlike the monolayer bulk material, the frequency of the light absorbed and absorption intensities manifest themselves in a sizable quantum-size effect. Besides, they can also remarkably be tuned by magnetic field and its setup. The valley-selectivity along with giant tunability of the optical absorption spectrum open up new opportunities for quantum information devices based on valley qubit and integrated valley and spin-tronic devices.

96. Anomalous photoconductivity in Bi2Te3 topological insulator films
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Topological insulators represent a new state of quantum matter that have an insulating bulk band gap but present metallic surface states. The surface states are topologically protected against non-magnetic impurities and it is possible the existence of a pure spin polarized current [1]. Three dimensional topological insulator as Bi2Te3 has attracted attention due to its topological properties and its potential application for development of spintronic devices [2]. In literature there is little or no information about photoconductivity in topological insulators, in particular in Bi2Te3. Photoconductivity measurements represent a powerful tool to probe the presence of defect states within be band structure and transport via more than one conduction channel. In this work we investigated the photoconductive properties of Bi2Te3 epitaxial layers in the temperature range of 77 to 300K. Unexpectedly, our measurements indicated that samples present negative photoconductivity, where the conductivity reduces under illumination, in the whole range of temperatures. In addition, these measurements revealed the presence of persistent photoconductivity effect for low temperatures, 77K-170K, which may be associated to the existence of a defect level within the band gap. From the photoconductivity decay curves, when light is removed, we could extract recombination times as a function of temperature and hence extract the energy associated to the traps located in band gap[3]. This study will reveal the effect of disorder in the photoconductivity properties in Bi2Te3 films and the role of surface states in the negative photoconductivity effect. Acknowledgments: The authors would like to acknowledge