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Spin Dynamics of Tellurium Isoelectronic Centers Bound Excitons in Zn-Se-Te Nanostructures[1] VASILIOS DELIGIANNAKIS, The City College of New York of CUNY, SIDDHARTH DHOMKAR , Queens College of CUNY, DANIELA PAGLIERO, The City College of New York of CUNY, HAOJIE JI, Queens College of CUNY, MARIA TAMARGO, The City College of New York of CUNY, IGOR KUSKOVSKY, Queens College of CUNY, CARLOS MERILES, The City College of New York of CUNY — Three-dimensionally confined structures such as quantum dots (QDs) have been of considerable interest due to their ability to closely imitate isolated atoms on mesoscopic length scales. Recently, single impurity states in bulk semiconductors have also attracted attention due to their ability to optically address quantum states. Here we show results pertaining to the optical and spin properties of Te isoelectronic centers present in type-II sub-monolayer QDs within a ZnSe matrix. Time resolved Kerr rotation (TRKR) measurements were performed using a degenerate pump-and-probe setup. Attempts to probe the QDs by direct optical excitation did not show any results most likely due to the weak oscillator strength of this transition resulting from their type-II nature. Centering the pump and probe pulses around the band edge of ZnSe and performing TRKR vs energy measurements we were able to address the spin dynamics of Te-isoelectronic centers present in the spacer layer. Results show that the τ*2 lifetimes exhibit a bi-exponential decay and persist up to 1 ns. Further measurements will be done on samples with varying Te concentration, as well as a function of the applied magnetic-field to understand the spin properties of this defect.

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