

Abstract Submitted
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Polarization memory of charged excitons in vertically coupled InAs/GaAs quantum dots SWATI RAMANATHAN, KUSHAL WIJESUNDARA, MAURICIO GARRIDO, ERIC STINAFF, Department of Physics and Astronomy, and Nanoscale and Quantum Phenomena Institute, Ohio University, Athens, Ohio 45701-2979, USA, MICHAEL SCHEIBNER, ALLAN BRACKER, DAN GAMMON, Naval Research Laboratory, Washington, DC 20375, USA — Polarized photoluminescence of the InAs/GaAs coupled quantum dot system was studied, and circular polarization memory signatures of the neutral exciton, the positive trion and the negative trion are reported. Our samples are Stranski-Krastanow dots, vertically separated by a GaAs barrier. We obtain results for circular polarization memory that are consistent with previous polarization studies on single quantum dots, indicating that coupled dot systems have polarization signatures very similar to single dot systems. Due to their structure, our samples display hole level anticrossings. As the system shifts from one positive trion configuration to the other, a continuous change in circular polarization memory is observed. This change in polarization memory is explained by hole tunneling and exchange interactions. Identifying the two positive trion configurations as neutral exciton-like and positive trion-like provides a theoretical basis for understanding the circular polarization memory signature.

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