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Searching for Indirect Optical Transitions in Semicon- ductor Quantum Ring Nanostructures using Light with Orbital Angular Momentum[1] ANDREW JOHNSON, MARK SIEMENS, University of Denver, GUILLERMO QUINTEIRO, Universidad de Buenos Aires, STEFANO SANGUINETTI, SERGIO BIETTI, Universita di Milano Bicocca — We present the results of micro-photoluminescence (μ-PL) experiments on GaAs quantum ring nanostructures (QR) when pumping with light having Orbital Angular Momentum (OAM). Excitons in QRs excited by twisted light (TL) have been predicted to absorb the OAM from the light, resulting in "indirect" optical transitions. Photoluminescence from several ($\sim$ 20) QRs is collected using a μ-PL apparatus. Preliminary results when pumping with $\ell = 1$ showed no noticeable change in the PL spectrum, though the significant number of QRs imaged onto the spectrometer likely obscured any change in the spectrum resulting from OAM-transfer.

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