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GaAs/InAs quantum dot exciton and trion excitation via nearby plasmonic waveguides MATT SEATON, YANWEN WU, USC Columbia, DAN GAMMON, ALLAN BRACKER, NRL, WU OPTICS GROUP TEAM, NRL TEAM — An open area of research in quantum plasmonics is the detailed characterization of the interaction between plasmonic structures and single quantum emitters. We observe the indirect excitation of excitons and trions in MBE grown GaAs/InAs quantum dots embedded in a Schottkey structure by nearby plasmons. The samples, grown on heavily doped N-type GaAs, were coated with a thin Cr layer to provide an electrical gate, through which we observe the photoluminescence spectrum of the different exciton charge states. Through spatially resolved photoluminescence spectroscopy, we verify the QD signature by laser pumping of surface plasmons in Ag thin film plasmonic waveguides near the dots. The waveguides were lithographically defined and embedded in the QD layer of the substrate via wet chemical etching and thermal vapor deposition. The characteristic PL spectra of the dots were collected and observed a large distance away from the excitation point, on the order of ten microns.

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