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**Exciton Emission from Uncoated and Plasmonic Gold/Alq3 Coated GaAs-AlGaAs Core-Shell Nanowires** MASOUD KAVEH, University of Cincinnati, QIANG GAO, CHENNUPATI JAGADISH[1], Australian National University, Canberra, Australia, GERD DUSCHER, University of Tennessee, Knoxville, HANS-PETER WAGNER, University of Cincinnati — We investigate the exciton emission from uncoated and gold/aluminum quinoline (Alq3) coated GaAs-AlGaAs core-shell nanowires (NW) by temperature- and intensity-dependent photoluminescence (PL). The vertically aligned 100 nm diameter zincblende NWs were grown on GaAs substrate using the Au catalyzed vapor-liquid-solid method. Au/Alq3 coated NW heterostructures were fabricated by organic molecular beam deposition. Intensity-dependent PL spectra show strong and weak emission bands at 1.515 and 1.47 eV at 15 K, which are attributed to the exciton transition and tentatively to an impurity related luminescence, respectively. Plasmonic NWs with an Au coating of nominal 10 nm thickness but without Alq3 spacer layer reveal a significant reduction of the PL intensity for both emission bands compared with the uncoated NW sample. The PL quenching is mainly attributed to an energy-transfer from free excitons in the NWs to plasmon oscillations in the deposited Au film. The plasmonic Au/Alq3 NW samples with same nominal Au layer thickness and Alq3 spacer layer thicknesses of 5 and 10 nm, respectively, reveal PL intensities which are noticeably stronger as in the Au coated NWs without Alq3 layer. The PL yield rises with increasing Alq3 spacer thickness.

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