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Photocurrent enhancement of an individual gallium nitride nanowire decorated with gold nanoparticles¹ JENCY PRICILLA SUNDARARAJAN, MEREDITH SARGENT, DAVID N. MCILROY, Department of Physics, University of Idaho, Moscow, ID 83844 — Variation in electron transport properties of individual n-type gallium nitride (GaN) nanowire and gold decorated gallium nitride (Au-GaN) nanowire were studied with respect to laser exposure of different wavelength and intensity. Single nanowire devices were manufactured by photolithography process in nanotechnology cleanroom, were characterized by scanning electron microscope (SEM) and transmission electron microscope (TEM). A drop in electrical conductivity of Au-GaN nanowire was observed relative to bare GaN nanowire. Under laser illumination, we noticed an enhancement in photocurrent in Au-GaN nanowire, which increased with increase in excitation power at ambient conditions. We present a comparative study of the opto-electrical behavior of bare GaN nanowire vs Au-GaN nanowire and explain the IV characteristics and FET characteristics with respect to the length and diameter of nanowire.

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