Photocurrent spectroscopy of GaAs/GaP hetero-structured nanowires

P. KUMAR, H.E. JACKSON, L.M. SMITH, University of Cincinnati, OH, USA, J. YARRISON RICE, Miami University, Oxford, OH, USA, J.H. KANG, Q. GAO, H.H. TAN, C. JAGADISH, The Australian National University, Canberra, ACT 0200, Australia — We study the photocurrent from photoexcited charge carriers in GaAs/GaP axial and radial hetero-structured nanowires (NWs). These NWs are grown using Metal-Organic Chemical Vapor Deposition (MOCVD) in [111]B direction with Au nano-particles as catalysts. As grown axial GaAs/GaP NWs are sonicated in methanol and dispersed on Si-SiO insulated substrate. Photolithography followed by Ti/Al (20nm/300nm) metal evaporation and lift-off is used to fabricate contacts in Metal-semiconductor-metal across single NW. Spatial imaging of photocurrent at different wavelengths distinguishes the GaP and GaAs regions in these NWs. Peak photocurrent is observed around GaP region for light wavelengths ~ 458nm whereas peak photocurrent is shift towards GaAs region for light wavelength ~ 800nm. Photocurrent measurements in GaAs/GaP strained core-shell NWs are in progress.

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P. Kumar
University of Cincinnati, OH, USA

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