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Photoluminescence from core/multiple-shell GaAs/AlGAs Nanowires M.A. FICKENSCHER, S.D. PERERA, H.E. JACKSON, L.M. SMITH, University of Cincinnati, J.M. YARRISON-RICE, Miami University, H.J. JOYCE, Y. KIM, Q. GAO, H.H. TAN, C. JAGADISH, Australian National University — We use photoluminescence (PL) and photoluminescence excitation spectroscopy (PLE) to study the electronic structure of GaAs/AlGaAs core multi-shell NWs. Using Au-catalyst assisted MOCVD, a nominally 2 nm GaAs quantum well tube (QWT) with AlGaAs barriers is formed surrounding a central 50 nm GaAs nanowire core. PL measurements on single nanowires reveal a line at the expected exciton energy for the core and, in addition, several higher energy lines not observed in simple core/shell structures. PLE measurements suggest a coupling of the confined states in the QWT and the core states. A broad PLE response centered at 1.67 eV is suggestive of an AlGaAs shell concentration of approximately 12%. We acknowledge the support of the NSF (0701703 and 0806700) and the Australia Research Foundation.

L.M. Smith
University of Cincinnati

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