

Abstract Submitted  
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**Comparison of the optical properties of bare and capped GaAs nanowires** L.M. SMITH, THANG B. HOANG, L.V. TITOVA, H.E. JACKSON, Dept. of Phys., Univ. of Cincinnati, Cincinnati, OH 45221, J.M. YARRISON-RICE, Dept. of Phys., Miami Univ., Oxford, OH 45056, YONG KIM, H.H. TAN, C. JAGADISH, Australian National University, Australia — We study the optical properties of single bare GaAs nanowires and GaAs/AlGaAs core/shell nanowires fabricated by the VLS technique. SEM and AFM images show that the wires are uniform in length (3-4 $\mu$ m long) and needle-shaped. Low temperature photoluminescence measurements of individual nanowires indicate that the quantum efficiency of the core/shell nanowires is significantly larger compared to the uncapped nanowires. We believe that the reason for the low emission efficiency of the uncapped nanowires is the significant influence of the surface-related non-radiative trap states. We anticipate that time-resolved measurements will show a significant increase of the recombination lifetime in the core/shell nanowires compared to the uncapped nanowires due to the passivation of the surface-related states by the AlGaAs shell. We acknowledge the support of the NSF through grants 0071797, 0216374, and the Australian Research Council.

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