Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Controlled growth of GaN nanowires by focused ion beam Pt-catalyst patterning JINYONG KIM, CHANG-YONG NAM, DOUGLAS THAM, JOHN E. FISCHER — One-dimensional GaN nanostructures are promising materials for nano-device applications. Control of nucleation density and position is a critical issue to fabricate such devices using GaN nanowires (NWs). However, only a few studies of controlled GaN growth are reported so far.[2)] An attractive approach is to use the spatial selectivity and resolution of focused ion beam (FIB) to deposit platinum (Pt) catalyst seeds for GaN NW growth at desired positions. In the present work, we demonstrate the successful patterned growth of GaN NWs on SiO_2/Si substrates or SiN_x TEM grids using FIB Pt-patterning. The thermal reaction of Ga_2O_3 and NH_3 on the substrates at $\sim$920°C was used for GaN NW growth.[3)] Grown NWs were analyzed by scanning electron microscopy (SEM) and transmission electron microscopy (TEM). We conclude that Pt acts as a catalyst for GaN NW growth, and that FIB provides the control over density and position of GaN NW growth, which ultimately can be utilized for nano-device fabrication. This work is supported by the NSF NIRT Program under Grant No. DMR-0304178 1) Y. Huang, X. Duan, Y. Cui, and C. M. Lieber, Nano Lett., **2(2)**, 2002, 101-104. 2) J. Li, C. Lu, B. Maynor, S. Huang, and J. Liu, Chem. Mater., **16**, 2004, 1633-1636. 3) C. Y. Nam, D. T. Tham and J. E. Fischer, Appl. Phys. Lett. (in press, December 6, 2004).

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Date submitted: 28 Nov 2004 Electronic form version 1.4