

Abstract Submitted  
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**As-Grown Single-Walled Carbon Nanotube Diodes**<sup>1</sup> GOVIND MALLICK, SHASHI KARNA, US Army Research Laboratory, SARAH LASTELLA, SANGEETA SAHOO, Rensselaer Polytechnic Institute, PULICKEL AJAYAN, Rice University — We present the observation of unidirectional electric current through as-grown single-walled carbon nanotubes (SWNTs) grown by catalytic chemical vapor deposition (CCVD) process. Long strands of as-grown SWNTs were utilized to fabricate multiple arrays of switching devices with the channel length of 3, 5, 7 and 10  $\mu\text{m}$  on a 15 mm x 15 mm  $\text{SiO}_2$  on Si substrate. Of the fabricated devices,  $\sim 34\%$  exhibited electrical activity. Of the active devices, about 70% exhibited diode-like unidirectional current, not observed previously in CCVD grown SWNTs. High resolution atomic force microscopic (AFM) analysis of the device structure and surface topology of SWNTs suggests the observed unidirectional current to result from surface irregularities and change in the chirality along the tube axis.

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