

Abstract Submitted
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A Novel Fabrication Method for Pristine Suspended Carbon Nanotube Devices¹ VINOD SANGWAN, VINCENT BALLAROTTO, MICHAEL FUHRER, ELLEN WILLIAMS, University of Maryland — A simple and scalable method has been developed to fabricate suspended carbon nanotube (CNT) field effect transistors using as-grown CNTs without subsequent chemical processing.² A printing process is used to transfer CVD-grown CNTs onto specially configured electrode (Au) sets fabricated on SiO₂. The versatility of the technique is demonstrated by controlling the number of suspended CNTs per device, and by re-using the same electrode set multiple times to produce the desired device characteristics. The quality of suspended CNTs is characterized by electrical transport as well as 1/f noise measurements. Standard resist-processed CNTs on SiO₂ substrates show p-type behavior and strong hysteresis associated with doping by the SiO₂ surface and charge trapping in the SiO₂, respectively. In contrast, suspended CNTs show ambipolar behavior with negligible hysteresis. Low frequency noise measurements on suspended CNT show 1/f behavior with Hooge's constant 2.6×10^{-3} , around 20 times less than that of CNTs lying on SiO₂, consistent with reduced effect of the SiO₂ charge traps, responsible for the bulk of the noise in CNTs on SiO₂.

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²*V. K. Sangwan et al, APL* **93**, 113112 (2008)

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