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**High Frequency Generation from Horizontally Aligned Carbon Nanotube Field-effect Transistors** DA SONG, University of Maryland College Park, VINCE BALLAROTTO, Laboratory for Physical Sciences, JOHN CUMINGS, University of Maryland College Park — Horizontally aligned carbon nanotubes grown on quartz substrates are used to fabricate top-gated field-effect transistors. Second, third and even higher order harmonic products are observed when high frequency signals are applied on gate side and detected from drain side. Measurements on control devices with identical geometry but without carbon nanotubes indicate all the harmonic generations are due to the carbon nanotubes in the channel. The second harmonic generation can be explained by following a traditional transistor model. The third and even higher harmonics observed are attributed to the Schottky barrier between the metal contacts and the carbon nanotubes. Devices with different metals as source and drain are fabricated to evaluate the effects of Schottky barrier. Taking the harmonic generation as the combination of a field-effect transistor and a Schottky diode, high frequency measurements and corresponding DC characterization data are combined to quantify the contribution of the non-linear elements on the measured output signal.

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