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Scanning Tunneling Microscopy of DNA-Carbon Nanotube Hybrids DZMITRY YAROTSKI, SVETLANA KILINA, Los Alamos National Laboratory, ALEC TALIN, Sandia National Laboratory, ALEXANDER BALATSKY, SERGEI TRETIAK, ANTOINETTE TAYLOR, Los Alamos National Laboratory — Production of carbon nanotube-based (CNT) devices holds a great promise for bringing the size of electronic circuits down to molecular scales. Recently, yet another step has been made towards achieving this goal by developing a new method for metal-semiconductor CNT separation, which relies on wrapping the CNT with ssDNA molecule[1]. Though it was shown that the outcome of the separation process strongly depends on the DNA sequence, further investigations have to be conducted to determine detailed structure of the hybrids and their electronic properties. Here, we use STM to characterize structural and electronic properties of the CNT-DNA hybrids and compare experimental results to theoretical calculations. STM images reveal 3.3 nm DNA coiling period, which agrees very well with the theoretical predictions. Additional width modulations with characteristic lengths of 1.9 and 2.6 nm are observed along the molecule itself. Although scanning tunneling microscopy confirms the presence of DNA in the hybrid and visualizes its structure, further experimental work is required to reveal the dependence of electronic properties of hybrids on their internal structure. [1] M. Zheng et al., Science 302, 1545 (2004).

Dzmitry Yarotski
Los Alamos National Laboratory

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