Abstract Submitted
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Statistically-Determined Molecular I-V Curves Measured by STM-Break Junction[1] JONATHAN R. WIDAWSKY, MASHA KAMENETSKA, YOUNG S. PARK, JENNIFER E. KLARE, COLIN NUCKOLLS, MICHAEL L. STEIGERWALD, MARK S. HYBERTSON, LATHA VENKATARAMAN, Columbia University and CFN, Brookhaven National Laboratory — We present a study of the current-voltage (I-V) characteristics for a series of amine and pyridine linked single molecule junctions. The junctions are created using the STM-based break-junction technique where an Au point-contact is broken in a solution of the the target molecules in ambient conditions. After the Au point contact breaks, the tip-substrate distance is held temporarily constant in order to achieve a steady metal-molecule-metal junction. The bias across the junction is ramped while current is measured to generate an I-V curve*. We find that the I-V curves can vary greatly from junction to junction for most conjugated molecules. Data from thousands of such I-V curves are compiled into 2D histograms to determine a "most-likely" current for a given voltage. We observe that these statistically-defined I-V curves depend on the molecule under study and the magnitude of the voltage ramp. In addition, from the slope of the I-V, we are able to track how the differential conductance increases as a function of applied voltage. *Nanotechnology **20** (2009) 434009

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