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Characterization of noise and dynamic fluctuations in carbon nanotubes DEREK KINGREY, PHILIP G. COLLINS, Department of Physics and Astronomy, University of California Irvine, Irvine, CA 92697-4576 — Carbon nanotubes (CNTs) are promising realizations of nanoscale electronics except for the dominant excess noise at low frequencies, which remains poorly understood. A full characterization of this noise on CNT transistor devices has been completed in the temperature range of 77 – 500K. The noise power spectral density (PSD) exhibits a combination of features, including strong deviations from 1/f behavior at the phase transitions of common contaminants including nitrogen and water. This indicates these adsorbates play key roles in CNT conduction even in high vacuum after high temperature degassing. We will present a comparison of measurements performed in air and in vacuum and further compare the noise to what can be achieved using encapsulated, forming-gas annealed devices.

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