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**Environmental effects on the electrical properties of narrow-gap carbon nanotubes** LEE ASPITARTE, DAN MCCULLEY, ETHAN MINOT, Oregon State University — Observations of single-walled carbon nanotubes (CNTs) with band gaps of 50 - 100 meV and diameters of approximately 2 nm pose an intriguing puzzle. The orthodox theory of CNTs predicts that such CNTs should have band gaps between 0 and 25 meV, yet these "narrow-gap" CNTs are routinely observed (band gaps in the range 50 – 100 meV). A possible explanation is that strong Coulomb interactions cause a Mott gap in nominally metallic CNTs (Deshpande et al., Science, 2009). To test this hypothesis, we have fabricated field-effect transistor devices from suspended narrow-gap CNTs. We have tested these devices in a variety of dielectric environments, including air, vacuum, $TiO_2$ coatings, and molecular liquids such as oil, anisole, toluene, isopropanol, and water. In many cases we can relate changes in electrical properties to changes in electrostatic disorder, gate capacitance, mobility and band alignment. We will discuss the possibility of an interaction-driven effect that is changed by the dielectric environment.

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