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Integration of Carbon Nanotubes with III-V(110) Surfaces LAURA RUPPALT, JOSEPH LYDING, University of Illinois at Urbana-Champaign — We have used scanning tunneling microscopy (STM) to investigate the unique electronic and physical properties of individual isolated carbon nanotubes dispersed onto semiconducting III-V substrates in an ultrahigh vacuum (UHV) environment. Pristine III-V(110) surfaces were obtained through in situ cleavage, with singlewalled carbon nanotubes (SWNTs) subsequently deposited via an UHV-compatible Dry Contact Transfer process[1]. Room temperature STM imagery confirms the intact transfer of individual tubes to the surface, while STM-enabled nanomanipulation suggests a substrate-induced stabilization of isolated SWNTs aligned along the (1bar 1 0) crystallographic direction, in registration with the substrate sublattice rows. Additionally, current image tunneling spectroscopy (CITS) maps of these SWNT/III-V(110) systems yield correlated topographic and electronic information with subnanometer resolution that provide evidence of the sensitivity of local nanotube electronic character to both inherent features of the nanotube as well as to proximal features of the underlying support substrate. [1]P.M. Albrecht and J.W. Lyding, APL 83, 5029 (2003).

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