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Plasma grown surface bound single wall nanotubes EUGENE TAM, KOSTYA OSTRIKOV, The University of Sydney, PLASMA NANOSCIENCE TEAM — Many researchers believe that Vertically Aligned Single Wall Carbon Nanotubes (VASWCNTs) are the answer to many foreseen issues with today's semiconducting industry involving miniaturization. However dense arrays of surface bound VASWCNTs can only ascertain a maximum length after which growth seems to halt, something of which is commonly attributed with catalyst poisoning. Nucleation of VASWCNTs also seems to require extremely high temperatures, unsuitable for direct growth of VASWCNTs onto nanoelectronic devices, however there has been some recent experimental evidence that sub 500 $^{\circ}$C growth of VASWCNTs is possible. In this poster, Monte-Carlo simulations have been used to elucidate the effects of plasmas on the substrate and lateral surfaces of the nanotubes, increasing mobility, adsorption and desorption. In addition to surface interactions, plasmas also allow for the control of precursor trajectories allowing adatoms to land closer to the base of the VASWCNT. We show that the precursor distribution along the lateral surface of the nanotubes is the primary cause for the VASWCNTs to slow down and, using appropriate plasma conditions, longer VASWCNTs and growth rates up to an order of magnitude higher than their neutral counter parts can be achieved in plasma environments.

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