

Abstract Submitted  
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**Electrical conductance between multi-walled carbon nanotube and Cu**<sup>1</sup> FENG GAO, JIANMIN QU, Northwestern University, MATTHEW YAO, Rockwell Collins Inc. — Vertical MWCNT interconnects have already been investigated for vias, or even for through-wafer 3D interconnects. Several studies have been done to understand the electrical conductance of MWCNT itself. The electrical conductance at a junction between MWCNT and metals has not been studied yet. Here we reported the intershell interaction effect on the electrical conductance at the Cu/MWCNT/Cu junctions by quantum mechanics calculations. Both end- and side-contacts between MWCNT and Cu electrodes were studied. In the end-contact junction, each individual CNT in the MWCNT acts as if it is a single wave CNT. The total conductance is almost the sum of the contributions from each individual nanotube. However, in the side-contact junction, the conductance between the outermost CNT and Cu electrode is dominant, whereas the intershell interaction leads to a reduction of the total electrical conductance. This is attributed to the enhanced localization of density of states in the vicinity of Fermi level by inner tube.

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