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**Electrical transport properties of selective area CVD grown single wall carbon nanotube devices**<sup>1</sup> ZHIXIAN ZHOU, RONGYING JIN, GYULA ERES, DAVID MANDRUS, Oak Ridge National Laboratory — Individual single wall carbon nanotube (SWNT) devices were constructed by the direct assembly of an individual SWNT on two opposing Au electrodes using an acetylene based low temperature selective area Chemical Vapor Deposition (CVD) method. Standard electron beam lithography and subsequent electron-gun assisted metal deposition were used to fabricate both the electrodes and catalyst islands. Electrical transport properties of the SWNT circuits were measured by applying a gate voltage to the Si substrate at various temperatures down to 0.3 K. Both semiconducting and metallic individual SWNTs were found bridging the Au electrodes with relatively small contact resistances. The semiconducting SWNTs exhibit a significant electrical field effect at room temperature with the conductance modulation approaching 5 orders of magnitude. High bias measurements on both suspended and substrate-supported metallic SWNTs reveal strikingly different phenomena. The details of the electrical transport results will be discussed.

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