



## **Investigating the Effect of Carbon Nanotube Growth Time of Carbon Nanotube-based Radiation Detectors**

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### **Abstract:**

Our group has designed and fabricated carbon nanotube (CNT) based radiation detectors that have demonstrated the ability to sense/detect ionizing radiation as shown previously. In this study, 5 sets of CNT detector devices were grown with varying chemical vapor deposition (CVD) growth rates and characterized for device performance. It is also known that applying a specified voltage to each device for a specified time “burns out” the undesirable metallic properties of the carbon nanotubes, which make these devices more sensitive to ionizing radiation. For each CNT growth time group, each device was burned out three times to improve detector response. The relationships between CNT growth time, required metallic burnout time, and device response are reported here. It was found that while longer growth times yielded better performing detectors, the required burnout times also increased.