

## FIELD EMISSION FROM AU-NANOPARTICLES-DECORATED SiC NANOWIRES

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### ABSTRACT

Cold cathode electron field emitters are potentially becoming very useful and attractive for application in a wide range of field emission devices such as X-ray tubes, high power microwave amplifiers, high brightness flat panel display, backlighting and other vacuum microelectronic devices [1, 2]. Among all the oxide semiconductors Silicon carbide (SiC) has been considered one of the most promising materials for field emitters owing to its superior antioxidation ability which can operate under unfavorable environment with relatively high oxygen partial pressure in their applications. SiC, as an important third-generation semiconductor material, with the wide band gap of 2.2-3.3 eV, high thermal stability, corrosion resistance, good thermal shock resistance and low thermal expansion which is considered as the potential application in the field of field emission devices. Previously, in depth investigations into the growth of various SiC nanostructure morphology and tailoring the bandage to lower the FE properties have been carried out [3, 4]. However, to the best of our knowledge, there are still few works that shed light on decorating SiC nanostructures with metal nanoparticles for obtaining enhanced FE performance. In this work, we report the exploration of Au nanoparticle-decorated SiC nanowire field emitters for enhanced FE behaviors. These results suggest that metal nanoparticle decoration could be an effective route to significantly enhance the FE performances of the SiC field emitters.

### References

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