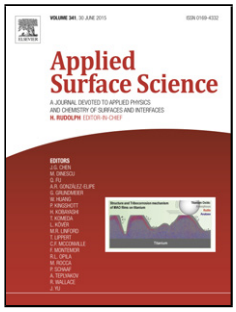


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# Curvature aided efficient axial field emission from Carbon nanofiber-Reduced graphene oxide superstructures on Tungsten wire substrate

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**Abstract**

Field emission characteristics found in reduced graphene oxide (RGO) and RGO based composite systems have always been an area of research interest mainly due to presence of prolific quasi aligned edges working as emitter sites. However, the specific role and extent of edge curvature geometry in RGO systems in regards to the enhancement of field emission has not discussed thoroughly prior to this work. In this work we demonstrate enhanced axial field emission due to top assembly of thin RGO layer over a quasi-vertically aligned carbon nanofiber thin film supported on a tungsten wire substrate. Furthermore, simulation analysis for our RGO based hybrid system using finite element modeling showed that two-stage local field amplification in RGO is responsible for the overall improvement of field emission characteristics. In support of our findings, a tentative explanation has been proposed based on the additional emission from RGO edges in between the CNF network resulting to the enhancement of axial field emission in the nanocomposite superstructure.