

Moiré patterns on STM images of graphite induced by rotations of surface and subsurface layers

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We have observed by means of scanning tunneling microscopy (STM) moiré patterns corresponding to the rotation of one graphene layer on HOPG surface. These moiré patterns were characterized by rotation angle and extension in the plane. Additionally, by identifying border domains and defects we can discriminate between moiré patterns due to rotation on the surface or subsurface layer. For a better understanding of moiré patterns formation, we have studied by first principles arrays of three graphene layers (TGL) and we have calculated their corresponding STM images. Such TLG arrays have a rotated layer (top or middle) around the stacking axis. We compare experimental and theoretical results and we show the strong influence of rotations in both surface layer and subsurface layer for moiré patterns formation in STM images. © 2013 Elsevier B.V. All rights reserved.