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Characterization of line defects in CVD graphene films with scanning plasmon interferometry ZHE FEI, University of California, San Diego, ALEKSANDR RODIN, Boston University, WILL GANNETT, University of California, Berkeley, SIYUAN DAI, University of California, San Diego, WILLIAM REGAN, University of California, Berkeley, ALEXANDER MCLEOD, MARTIN WAGNER, University of California, San Diego, BENJI ALEMAN, University of California, Berkeley, MARK THIEMENS, University of California, San Diego, GERARDO DOMINGUEZ, California State University, San Marcos, ANTONIO CASTRO-NETO, National University of Singapore, ALEX ZETTLE, University of California, Berkeley, FRITZ KEILMANN, Max Planck Institute of Quantum Optics, MICHAEL FOGLER, DIMITRI BASOV, University of California, San Diego
— Line defects that are omnipresent in graphene films fabricated with chemical vapor deposition method (CVD) were studied with scanning plasmon interferometry (SPI)—a technique capable of convenient nano-characterization of graphene devices in ambient conditions. The characteristic SPI patterns of line defects are plasmonic twin fringes, which are generated due to interference between surface plasmons (SPs) of graphene launched by a scanning probe and reflected by the line defects. The twin fringes allow us to visualize and distinguish various types of line defects including cracks, wrinkles, and even grain boundaries. Further modeling of the twin fringes provides detailed information on the electronic properties associated with these line defects.

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