

Abstract Submitted  
for the MAR14 Meeting of  
The American Physical Society

**Large and Tunable Optical Absorption in Quasi-Periodically Corrugated Graphene** GUANG-XIN NI, DE LIMA FERREIRA RODRIGUES MA, HENRIK ANDERSEN, Graphene Research Center and Department of Physics, 2 Science Drive 3, National University of Singapore, Singapore 117542, SEUNG-JAE BAECK, JONG-HYUN AHN, School of Electrical & Electronic Engineering, Yonsei University, Seoul 120-749, Korea, VIANA-GOMES JOSE CARLOS, VITOR M. PEREIRA, CASTRO NETO ANTONIO HELIO, BARBAROS ÖZYILMAZ, Graphene Research Center and Department of Physics, 2 Science Drive 3, National University of Singapore, Singapore 117542 — Graphene is currently one of the notable players in the intense drive towards bendable, thin, and portable electronic displays. Given that the intrinsic transparency of a graphene monolayer is 97.7%, any reproducible and controllable modulation of transparency can have a significant impact for graphene as a viable transparent conducting electrode. Here we demonstrate a large and tunable optical absorption modulation in large-scale CVD graphene by introducing quasi-periodic ripples using functional elastomer substrates. We find that the optical modulation is more than 15% at visible wavelengths and moreover such optical modulation can be simultaneously tuned on and off by controlling the elastomer status. The simple device configuration and large tunability optical response of graphene demonstrated in this study can be very important towards novel ultra-thin optical polarizer devices applications.

Guang-Xin Ni  
Graphene Research Center and Department of Physics,  
2 Science Drive 3, National University of Singapore,  
Singapore 117542

Date submitted: 13 Nov 2013

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