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Probing the Ni(111)-graphene interface using Raman spectroscopy GUANGJUN CHENG, IRENE CALIZO, ANGELA HIGHT WALKER, PML, NIST — Theoretical simulations have shown that due to the hybridization of Ni d-electrons with the π-orbitals of graphene, graphene phonon dispersion is significantly altered (Nano Lett, 2010, 10, 4335-4340). There is no Raman signal from graphene on Ni(111) due to the suppression of the Kohn anomaly. In our work, we deposit a Ni thin film by thermal evaporation onto mechanically exfoliated graphene, few-layer graphene (FLG), and graphite, and probe the Ni-graphene interface using Raman spectroscopy. When the sample is annealed in forming gas, a Ni(111) thin film is produced on graphene, FLG, and graphite. We observe the disappearance of Raman signals from graphene underneath Ni(111) when using low laser power and the re-appearance of the Raman signals from the graphene with a higher power excitation laser. This work provides direct experimental evidence for the strong interaction between Ni(111) and graphene.

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