# Graphene and hexagonal Boron Nitride 2D Super Structures Analysed by Scanning Probe Spectroscopy

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By high temperature exposure of ethylene or borazine [(HBNH)3] on transition metals between 500-1000∘ C under UHV conditions leads to the formation of graphene or a boron nitride monolayer, respectively [1]. A lattice mismatch between the layers and the metal surfaces cause a hexagonal superstructure but while graphene is electrically conducting the boron nitride layer is insulating.

STM measurements showed various imaging contrasts arising from the complicated surface geometry and electronic properties. In our nc-AFM and KPFM experiments the complexity of the superstructures is also frequently observed in the topography as well as in the local contact potential difference [2]. We thoroughgoing investigate the tip-sample interaction by 2D dynamic force spectroscopy at room temperature. From the variations in the resonance frequency of the probing tip in close proximity to the sample and the low dissipation accompanying the tip vibrations an elastic nature of the graphene and boron nitride elevations is concluded.

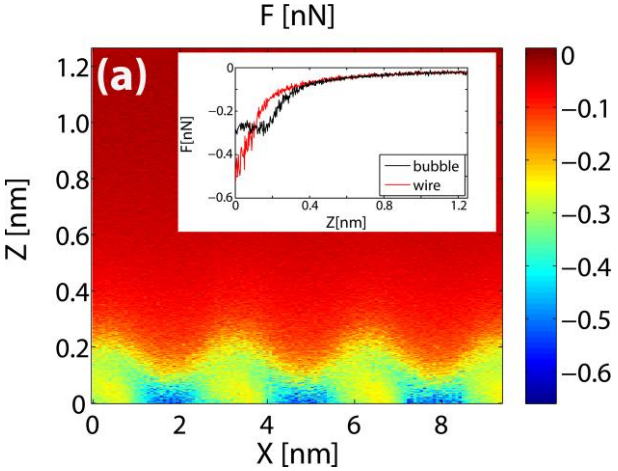


*Figure 1:2D spectroscopy data plots of the total force of the tip-sample system. The inset shows site-dependent (hill, valley) 1D spectroscopy curves, extracted out of the 2D data. The curves are respectively averaged over 4 curves for every site. Parameters: A = 7 nm, $U_{bias}$ = −819 mV*

## References

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