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Epitaxial Graphene on Co(0001) Probed by STM Measurements and First Principles Calculations DEBORAH PREZZI, Columbia University (NY-USA) & S3-CNR-INFM (Modena - ITALY), DAEJIN EOM, KWANG T. RIM, HUI ZHOU, MICHAEL LEFENFELD, COLIN NUCKOLLS, Columbia University, MARK HYBERTSEN, Brookhaven National Laboratory, TONY HEINZ, GEORGE FLYNN, Columbia University — Structural and electronic properties of finite-sized graphene patches on Co(0001) have been investigated through a combined experimental and theoretical characterization. The analysis of low-temperature scanning tunneling microscopy images establishes an atomically uniform epitaxial configuration of graphene on the Co surface in which a C atom is a-top the interface Co atom, in agreement with total energy calculations based on a density-functional theory (DFT) approach. Scanning tunneling spectroscopy measurements show that the electronic properties of the interface are significantly different from both the clean Co surface and isolated graphene, suggesting a strong electronic coupling at the interface. DFT calculations provide a detailed analysis of the spectrocopic features in terms of spin and site contributions and reveal the coupling between graphene p and Co d states.

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