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	Nota di contenuto	Introduction -- Measuring Interfacial Properties of Graphene/polymethyl methacrylate (PMMA) through Uniaxial Tensile Test -- Mechanical Behavior at Graphene/polymethyl methacrylate (PMMA) Interface in Thermally Induced Biaxial Compression -- Measuring Interfacial Properties of Graphene/silicon by Pressurized Bulging Test -- Interfacial Mechanics between Graphene Layers -- Summary and Prospect.
	Sommario/riassunto	This thesis shares new findings on the interfacial mechanics of graphene-based materials interacting with rigid/soft substrate and with one another. It presents an experimental platform including various loading modes that allow nanoscale deformation of atomically thin films, and a combination of atomic force microscopy (AFM) and Raman spectroscopy that allows both displacement and strain to be precisely measured at microscale. The thesis argues that the rich interfacial behaviors of graphene are dominated by weak van der Waals force, which can be effectively modulated using chemical strategies.

The continuum theories are demonstrated to be applicable to nano-mechanics and can be used to predict key parameters such as shear/friction and adhesion. Addressing key interfacial mechanics issues, the findings in thesis not only offer quantitative insights in the novel features of friction and adhesion to be found only at nanoscale, but will also facilitate the deterministic design of high-performance graphene-based nanodevices and nanocomposites.