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Centimeter-scale, Highly-Ordered, Continuous Graphene on Metal Surface and Its Moiré Template Effect[1] YI PAN, MIN GAO, HAIGANG ZHANG, JINHAI MAO, YUHANG JIANG, SHIXUAN DU, HONGJUN GAO, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, China — The limited size and quality of the single- and multi-layer graphene synthesized with the existing methods hinders the investigation of the intrinsic physical properties of the graphene and realization of its potential applications. We will present a new method for synthesizing large scale single layer graphene by thermal annealing of ruthenium single crystal containing carbon. Low energy electron diffraction (LEED) and scanning tunneling microscopy (STM) indicate the graphene grows to as large as millimeter dimensions with good long-range order, continuity, and perfect crystallinity. Such high quality sample has allowed a single layer graphene to greatly modulate the thermoelectric potential and polarity of the system. Furthermore, the adsorption behavior of clusters and molecules using the graphene-based Moiré pattern will also be presented.

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