Abstract Submitted
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Growth of atomically smooth MgO films on graphene by molecular beam epitaxy.[1] KATHLEEN MCCREARY, University of California, Riveside, WEI HAN, WEI-HUA WANG, KEYU PI, WENZHONG BAO, FENG MIAO, ROLAND KAWAKAMI, CHUN-NING LAU, UCR — Graphene has been the focus of many recent studies involving both electronic and spintronic devices due to its tunable charge carriers, high mobility, and possibility of long spin coherence lifetimes. To improve the spin injection into graphene spintonic devices, dielectric layers, such as MgO, are often used to minimize the conductivity mismatch between graphene and electronic contacts. We investigate the growth of MgO films on graphene by molecular beam epitaxy and find that surface diffusion promotes a rough morphology. To reduce the mobility of surface atoms, the graphene surface is dressed by Ti atoms prior to MgO deposition. With as little as 0.5 ML monolayer of Ti, the MgO overlayer becomes atomically smooth. Single layer graphene has been patterned into nanoscale devices to study the effect of the Ti dressing layer and MgO overlayer on the electronic and spintronic properties.

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