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Synthesis of Large Scale MoS2-Graphene Heterostructures KATHLEEN MCCREARY, AUBREY HANBICKI, ADAM FRIEDMAN, JEREMY ROBINSON, BEREND JONKER, Naval Research Laboratory — A rapidly progressing field involves the stacking of multiple two dimensional materials to form heterostructures. These heterosctructures have exhibited unique and interesting properties. For the most part, heterostructure devices are produced via mechanical exfoliation followed by careful aligning and stacking of the various components, limiting dimensions to micron-scale devices. Chemical vapor deposition (CVD) has proven to be a useful tool in the production of graphene and has very recently been investigated as a means for the growth of other 2D materials such as MoS2, hexagonal boron nitride and WS2. Using a two-step CVD process we are able to synthesize MoS2 on CVD grown graphene. AFM and Raman microscopy of the MoS2-graphene heterostructure show a uniform and continuous film on the cm scale.

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