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Investigation of factors that influence the quality of van der Waals heterostructures made by direct pick-up RUI LYU, Univ of California - Riverside, PAN CHENG COLLABORATION, YONG WU COLLABORATION, ADRIAN NOSEK COLLABORATION, MARC BOCKRATH COLLABORATION — Two dimensional material van der Waals heterostructures, such as twisted bilayer graphene, can be assembled by the prevailing pick-up procedure.[1] [2] However, the size and the quality of the devices are limited by defects such as "Bubbles" in the samples. We investigate sources that can impair the quality of van der Waals heterostructures using optical, atomic force microscope, and scanning electron microscope imaging. Choices of polymer layers for picking up, schemes of stacking heterostructures, and influences of pre- and post- furnace annealing for stack fabrication are studied. In conjunction with transport measurements, we refine the procedure for making high-quality twisted bilayer graphene and other heterostructure devices.

[1]K. Kim et al. **Nano Lett.** 16.3:1998 (2016)
[2]Y. Cao et al. **Phys. Rev. Lett.** 117.11:116804(2016)

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