Counting molecular-beam grown graphene layers

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We have used the ratio of the integrated intensity of graphene's Raman G peak to that of the silicon substrate's first-order optical phonon peak, accurately to determine the number of graphene layers across our molecular-beam (MB) grown graphene films [1]. We find that these results agree well both, with those from our own exfoliated single and few-layer graphene flakes, and with the results of Koh *et al.* [2]. We hence distinguish regions of single-, bi-, tri-, four-layer, etc. graphene, consecutively, as we scan coarsely across our MB-grown graphene. This is the first, but crucial, step to being able to grow, by such molecular-beam-techniques, a specified number of large-area graphene layers, to order.

[1] U. Wurstbauer *et al.*, Carbon **50**, 4822 (2012).
[2] Y.K. Koh *et al.*, ASC Nano **5**, 269 (2011).