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Title:On the effective plate thickness of monolayer graphene from flexural wave propagation Authors:Kim, Sung Youb (1); Park, Harold S. (2)

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Abstract: We utilize classical molecular dynamics to study flexural, or transverse wave propagation in monolayer graphene sheets and compare the resulting dispersion relationships to those expected from continuum thin plate theory. In doing so, we determine that regardless of the chirality for monolayer graphene, transverse waves exhibit a dispersion relationship that corresponds to the lowest order antisymmetric (A0) mode of wave propagation in a thin plate with plate thickness of h = 0.104 nm. Finally, we find that the achievable wave speeds in monolayer graphene are found to exceed those reported previously for single walled carbon nanotubes, while the frequency of wave propagation in the graphene monolayer is found to reach the terahertz range, similar to that of carbon nanotubes. © 2011 American Institute of Physics.