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Dislocations in graphene LUIS L. BONILLA, Universidad Carlos III de Madrid, Spain, ANA CARPIO, Universidad Complutense de Madrid, Spain — We study the stability and evolution of various elastic defects in a flat graphene sheet using a periodized discrete elasticity model. Two types of dislocations are found to be stable: "glide" dislocations consisting of heptagon-pentagon pairs, and "shuffle" dislocations, an octagon with a dangling bond. Unlike the most studied case of carbon nanotubes, Stone Wales defects are dynamically unstable in the planar graphene sheet and they annihilate when the dynamics is overdamped. Similar defects in which one of the pentagon-heptagon pairs is displaced vertically with respect to the other one are found to be dynamically stable. Effects of curvature of the graphene sheet are also introduced and do not change the previous results. A discussion of the origin of damping is provided.

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