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Graphene rubber band: suspended graphene sheets with controlled uniaxial strain ZENGHUI WANG, DAVID HUTCHISON, CARLOS RUIZ-VARGAS, PINSHANE HUANG, SUNIL BHAVE, DAVID MULLER, JIWOONG PARK, Cornell University — The recent advances in growth and transfer techniques of CVD graphene have made it an excellent candidate for making electrical and mechanical devices, especially at larger scale than with exfoliated graphene flakes. Nevertheless, the electrical, electromechanical and optomechanical properties of CVD graphene need to be further characterized before one can make full use of this 2D material. Here, we study the properties of CVD graphene under well controlled uniaxial strain. We fabricate devices with adjustable-width gaps actuated by comb drives, and transfer CVD graphene sheets onto these gaps. We study the slipping, straining, and breaking of CVD graphene in real time under TEM, with identification of individual single crystal domains and domain boundaries.

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