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**Helium adsorption potential near mechanically deformed graphene** NATHAN NICHOLS, VALERI KOTOV, ADRIAN DEL MAESTRO, University of Vermont — Mechanical strain modifies the van der Waals interactions of neutral adatoms near two-dimensional materials like graphene and commonly used parameters for helium interacting with carbon do not capture these effects. Using the polarization function of strained graphene, we have compared the long-distance Lifshitz dispersion force with an effective potential computed from the sum of two-body interactions. The resulting optimized many-body adsorption potential exhibits an anisotropic minimum that is displaced higher above the graphene sheet as unixaxial strain is increased. The competing energy scales introduced by strain open up the possibility of mechanically tuning novel anisotropic adsorbed superfluid phases of helium on graphene.

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