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Path-Integral Monte Carlo Simulations of Ideal Strength and Peierls Stress in HCP 4He EDGAR JOSUÉ LANDINEZ BORDA, MAURICE DE KONING, Instituto de Física Gleb Wataghin, Universidade Estadual de Campinas, UNICAMP — The ideal strength of a crystal is defined as the stress required to induce plastic deformation in a defect-free crystal. It is a theoretical upper bound to the strength of real crystals. The Peierls stress, on the other hand, is the minimum stress required to move a lattice dislocation and produce defect-mediated deformation. Here we present results for both quantities in HCP 4He as obtained from a series of Path-integral Monte Carlo simulations and discuss them in terms of its deformation behavior.

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