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Helicity in superfluids HRIDESH KEDIA, DUSTIN KLECKNER, University of Chicago, DAVIDE PROMENT, University of East Anglia, WILLIAM T.M. IRVINE, University of Chicago — Ideal fluid flow conserves a special quantity known as helicity, in addition to energy, momentum and angular momentum. Helicity can be understood as a measure of the knottedness of vortex lines of the flow, providing an important geometric tool to study diverse physical systems such as turbulent fluids and plasmas. Since superfluids flow without resistance just like ideal (Euler) fluids, a natural question arises: Is there an extra conserved quantity akin to helicity in superfluids? We address the question of a "superfluid helicity" theoretically and examine its consequences in numerical simulations.

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