Abstract Submitted
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Probing Topological Matter with Sound[1] DAVID SCHMELTZER, City College of New York — We introduce a microscopic formulation to identify the stress in a quantum fluid to compute the stress viscosity with sound waves. The viscosity stress tensor is used to determine, e.g. the ultrasound attenuation in superconductors. When an Abrikosov lattice is formed on the surface of a Topological Insulator in a external magnetic field, Majorana modes form dispersive bands. We show that the ultrasound attenuation is modified by the Majorana modes offering a novel method to identify Topological Superconductors. Moreover we compute the stress tunneling which uses Majorana modes and represent the sound analogue of the Andreev crossed reflection. We check the violation of the sound momentum conservation of systems which only exists on the boundary of a higher dimensional system,e.g. a $1D$ chiral fermion which can exist at the boundary of a $2D$ Quantum Hall system.

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