

Abstract Submitted
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Frequency Dependence of Hydrodynamic Inductance in 4He Helmholtz Resonators TALSO CHUI, KONSTANTIN PENANEN, JPL/Caltech
— The oscillatory motion of helium near the superfluid transition temperature changes from superfluid-only to two-component solid body when viscous length becomes smaller than the flow channel size. In Helmholtz oscillators commonly used to study Josephson effect and related phenomena in helium, the size of the sub-micron apertures is typically smaller than the viscous length, while the size of the macroscopic flow path can be smaller or larger than the viscous length, depending on the frequency used. This opens the possibility that the hydrodynamic inductance ratio of the flow path and the aperture array can be varied. We discuss the implications of this behavior for superfluid SQUID mechanical and thermodynamic stability.

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