

Abstract Submitted  
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**Theory of phase-slip-center effects on superconducting kinetic inductance** MASAHIKO MACHIDA, YUKIHIRO OTA, Japan Atomic Energy Agency — Fluctuations significantly alter the conventional picture on transport phenomena in 1D superconductors. We study the current-dependence of the kinetic inductance in superconducting wires using the Ginzburg-Landau approach with fluctuations. We obtain a non-monotonic current-dependence of the kinetic inductance when the thermal fluctuations predominate the behaviors of the superconducting phase. This result is ascribed to the occurrence of phase-slip centers from thermally-activated processes. We also find that our approach qualitatively reproduces the experiment by Annunziata et al. [Nanotechnology 21, 445202 (2010)]. Moreover, we discuss the effects of thermal fluctuations on the characteristics of superconducting detectors. We will also discuss the effects of quantum phase slips on superconducting detectors.

Yukihiro Ota  
Japan Atomic Energy Agency

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