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Microscopic theory of thermal phase slips in clean narrow superconducting wires¹ ALEXANDER ZHAROV, ANDREI LOPATIN, ALEXEI KOSHELEV, VALERII VINOKUR, Argonne National Laboratory — We consider structure of a thermal phase-slip center for a simple microscopic model of a clean one-dimensional superconductors in which superconductivity occurs only within one conducting channel or several identical channels. Surprisingly, the Eilenberger equations describing the saddle-point configuration allow for exact analytical solution in the whole temperature and current range. This solution allows us to derive a closed expression for the free-energy barrier, which we use to compute its temperature and current dependences.

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