**PS21**

## SUPERCONDUCTOR-INSULATOR TRANSITION IN SUPERCONDUCTING NANOWIRES

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We investigate superconductor-insulator quantum phase transitions in ultrathin capacitively coupled superconducting nanowires with proliferating quantum phase slips. We derive a set of coupled Berezinskii-Kosterlitz-Thouless-like renormalization group equations demonstrating that interaction between quantum phase slips in one of the wires gets modified due to the effect of plasma modes propagating in another wire. As a result, the superconductor-insulator phase transition in each of the wires is controlled not only by its own parameters but also by those of the neighboring wire as well as by mutual capacitance. We argue that superconducting nanowires with properly chosen parameters may turn insulating once they are brought sufficiently close to each other [1].

Hence, superconducting nanowires may turn insulating provided they are brought close enough to each other. It would be interesting to observe this effect in forthcoming experiments with superconducting nanowires.

**References:**

[1]. Alex Latyshev, Andrew G. Semenov and Andrei D. Zaikin. Superconductor-insulator transition in capacitively coupled superconducting nanowires.
Beilstein J. Nanotechnol. 2020, 11, 1402–1408. https://doi.org/10.3762/bjnano.11.124

spectral analysis mecha-nism, which makes it possible to implement it as affordable, small-sized, low-material, and low-power devices. All this is considered in the context of solving urgent prob-lems of quantitative remote identification of the components of an optically trans-parent medium suitable for solving environmental issues.

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