Phase Slips and Superconductor-insulator Transition in Nitride Nanowire

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***Abstract* – We present the report on superconductor-insulator transition of high-quality epitaxial NbTiN superconducting nanowires (SNWs) with a wide range of normal resistance, R_n, varying from a few kilo ohm to several tens of kilo ohms. For the detailed discussion of the superconductor-insulator transition in 1D specimen from the viewpoint of quantum phase transition, we present some transport properties of our SNWs, which have characteristics of low-dimensional superconductors. The analysis based on the quantum phase slip model for the SNW as an element dual to Josephson junction, suggests that the separation of the superconducting and insulator phases may be controlled by the ratio of quantum phase slip amplitude energy E_S and inductive energy of SNW E_{Li}, E_S/E_{Li}.**

***Keywords (Index Terms)* – Phase slip, superconductor-insulator transition, nanowire.**

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