<u>Nernst Effect as a Signature of Quantum Fluctuations in Quasi-1D Superconductors</u>

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The Nernst effect, whereby an electric voltage develops perpendicularly to a thermal gradient in the presence of a magnetic field, is known to be anomalously enhanced by superconducting fluctuations. While the role of thermal fluctuations was extensive studied both theoretically and experimentally, less is known about the contribution of quantum fluctuations which are expected to dominate close to a superconductor-insulator transition (SIT). In this talk, I will present a theoretical study which addresses this phenomenon by focusing on a quasi- one-dimensional (1D) superconducting device, in which the geometry dictates an appreciable Nernst effect in the fluctuations-dominated regime. To this end, we derive the transverse thermoelectric coefficients and their relation to diamagnetism in a two-leg Josephson ladder subject to a perpendicular magnetic field B, where a small temperature difference between the legs induces voltage along the ladder due to transport of vortices across the junction. At low temperatures T, vortex transport is dominated by their quantum tunneling. The relative simplicity of the model describing the quantum dynamics of superconducting fluctuations allows an explicit evaluation of the transverse Peltier coefficient, the Nernst coefficient and the magnetization density as functions of B and T in a wide range of parameters. In particular, we investigate their behavior when the parameters of the superconducting wires (or Josephson-junction chains) constituting the legs of the ladder are tuned through a SIT. Most remarkably, we find that while the transverse Peltier coefficient is directly proportional to the magnetization and is smoothly evolving, the Nernst coefficient exhibits a prominent peak close to the transition, which becomes progressively enhanced at low T.