Seminar/Talk

Non-equilibrium quasiparticles in superconducting qubits

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Host: Andrew Higginbotham

Superconducting qubits became a unique tool for studying the dynamics of the Bogoliubov quasiparticles. Measurement of the transition rates between various qubit states provides an access to the evolution and steady states of the quasiparticle density. The circuit-QED qubit experiments in conjunction with the theory which we developed reveal the low-temperature saturation of the quasiparticle density, signaling their non-equilibrium nature; in some cases we are able to point to the source of the excess quasiparticles. By analyzing the evolution of the intentionally-produced quasiparticles, we also characterized the quasiparticle trapping by the core of a single magnetic vortex and by small normal-metal inclusions. In a separate effort, measurements of the T1 time of a flux-sensitive qubit (dubbed fluxonium) revealed, for the first time, the long-sought cos? dissipative Josephson current caused by quasiparticle tunneling.

Friday, March 13, 2020 11:00am - 12:00pm
Heinzel Seminar Room / Office Bldg West (I21.EG.101)

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