



Seminar/Talk

Ultrastrong coupling between Andreev bound states and a high impedance lumped-element resonator

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Host: Anton Bubis (Andrew Higginbotham)

Josephson junctions in Al/InAs nanowires host Andreev bound states[1] (ABSs) and can be considered as a platform for realization of gate-tunable Andreev qubits[2-4]. An acute challenge of such architecture is to improve the coupling between ABSs and a microwave resonator. Here, we report microwave characterization of an Al/InAs nanowire weak link embedded in a superconducting loop with a lumped-element resonator patterned from a thin NbTiN film with high kinetic inductance. We demonstrate that our approach offers a compact geometry, a high resonator impedance above 12 kOhm and remarkably large coupling rates between ABSs and the resonator mode reaching the value of 1.2 GHz. This result provides a basis for exploration of strongly correlated light-matter states in cQED. References[1] A. Furusaki and M. Tsukada, Phys. Rev. B 43, 10164 (1991).[2] A. Zazunov et al, Phys. Rev. Lett. 90, 087003 (2003).[3] M. Hays et al, Phys. Rev. Lett. 121, 047001 (2018)[4] C. Metzger et al, Phys. Rev. Res. 3, 013036 (2021).

Monday, April 29, 2024 10:00am - 11:00am

Office Bldg West / Ground floor / Heinzl Seminar Room (I21.EG.101)



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