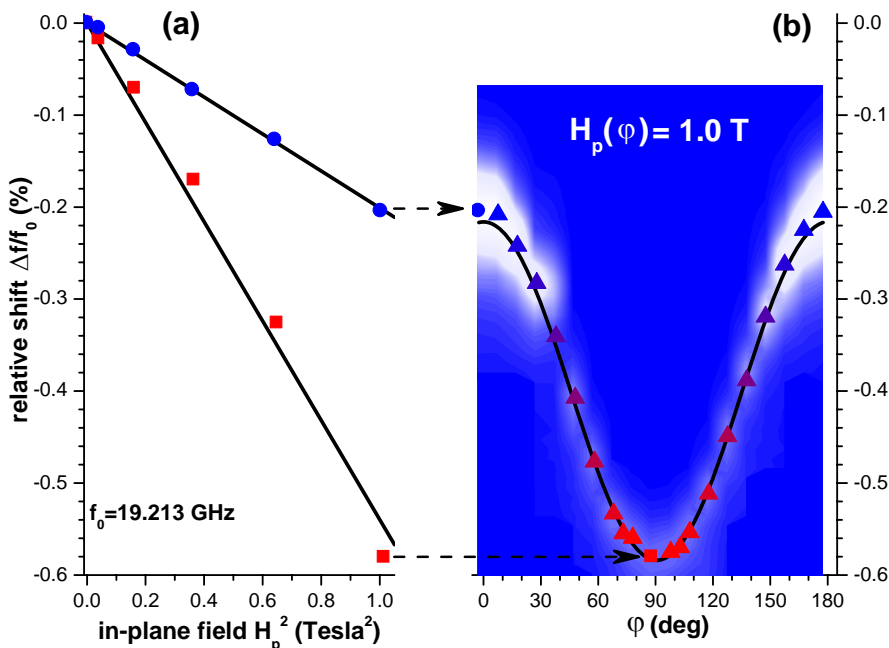
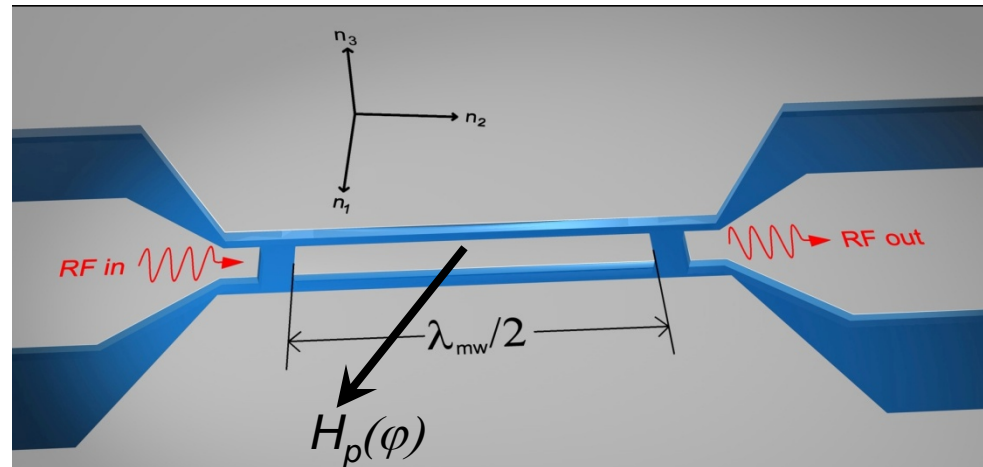


First Measurements of the Field-dependent Nonlinear Meissner Effect : A probe of the pairing symmetry

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A Nb thin-film superconducting resonator is used to demonstrate the non-linear Meissner effect (NLME), that is, Cooper pairs depairing in screening currents, due to strong, static magnetic fields. On the right, the sketch of a 20GHz on-chip resonator is shown, as measured in a dilution refrigerator. A rotating in-plane field $H_p(\varphi)$, generated by a 3-coil system, explores the pairing symmetry and the shape anisotropy of resonator's central stripe line. By changing stripe's kinetic inductance, NLME is modifying the resonance



frequency, as shown on the left figure (a: relative shift vs. field, b: transmission contour plots vs. field orientation). Lines in black represent theoretical fits using Usadel equations. Since NLME is sensitive to the pairing symmetry, we propose to extend this method to study superconductors other than Nb.

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