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Flux-quantization effect in superconducting niobium loops[1]
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— Superconducting loops have periodical oscillation of critical temperature T_c as a function of applied perpendicular magnetic field H The corresponding periodicity is related to superconducting flux quantization, $h/2e$, due to size constraint. When the loop size shrinks, however, new phenomena can appear. For example, the oscillation can show a h/e rather than $h/2e$ periodicity if the hole diameter is comparable to the superconducting coherence length. We present experimental investigation of flux-quantization effect in mesoscopic superconducting niobium loops. We developed a new approach to fabricate high quality loops by combining electron-beam lithography with focused-ion-beam (FIB) milling techniques. Periodic oscillations were observed in both the $H-T$ phase diagram and the magnetoresistance. Analysis of the data with various theories will be presented

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