

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Flux jump in superconducting Pb networks at fractional numbers of the matching fields TAKEKAZU ISHIDA, YOSHIAKI MATSUSHIMA, MAKOTO SHIMIZU, Osaka Prefecture University, MASAHIKO HAYASHI, Akita University, HIROMICHI EBISAWA, Tohoku University, MASARU KATO, Osaka Prefecture University,, OSAMU SATO, Osaka Prefectural College of Technology, Neyagawa, KAZUO SATO, TSUTOMU YOTSUYA, Technology Research Institute of Osaka Prefecture — The extended Little-Parks effect of superconducting network is known as a periodic T_c variation as a function of magnetic field. Superconducting Pb honeycomb networks of matching field 0.106 G and triangular microhole lattice of Pb of matching field 0.425 G have been fabricated by the combined techniques of the electron beam lithography and a lift-off process of evaporated Pb films. The application of magnetic field corresponds to the vortex doping into networks. We measured the magnetization of the networks systematically by using a SQUID magnetometer. We found that flux jump appears rather periodically as a function of magnetic field. Flux jumps may be induced by a periodic decrease in the critical current density of the network. To the authors' knowledge, this is for the first time to observe the extended Little-Parks effect appeared in flux jumps. We also discuss the anomalous matching effect.

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Date submitted: 25 Nov 2007

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