

## Interstitial vortex in superconducting film with honeycomb array

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Superconducting Nb film with honeycomb array of holes are studied using magnetotransport measurement. Two types of resistance minima with different field spacing indicating the reconfiguration of vortex lattice from honeycomb to triangular arrangement. We find hysteretic effects presented in a large field region from  $H = 2H_1$  to  $H = 8.5H_1$ . We also show the transition field of the two regimes in magnetoresistance curves is temperature dependent. These findings confirm the existence of interstitial vortex. In addition, a comparison study show the depth of fractional matching minima at  $1/2$ ,  $1/4$ , and  $3/4$  depend on the direction of drive while the integer matching minima show no difference under different current directions.