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Induced in-plane order in vortex liquid by regular holes array in $Bi_2Sr_2CaCu_2O_{8+y}$[1] SHUUICHI OOI, TAKASHI MOCHIKU, SATOSHI ISHII, SHAN YU, KAZUTO HIRATA, National Institute for Materials Science, SUPERCONDUCTING MATERIALS RESEARCH CENTER COLLABORATION — To study the influence of artificial hole defects on the vortex matter in high-T_c superconductors, we have measured electrical transport properties in the vortex state of $Bi_2Sr_2CaCu_2O_{8+y}$ single-crystal thin films which have holes configurations with different symmetries. In samples with triangular and square holes arrays, the flow resistance of pancake vortices exhibits dips at multiples of the matching fields, while it is absent in a random hole configuration. Such matching effect occurs even in a vortex liquid phase, suggesting that the periodicity in holes configuration induces in-plane order in liquid flow.

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