

Abstract Submitted  
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**Matching Effect of Vortex liquid in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+y}$  with Artificial Periodic Defects** SHUICHI OOI, National Institute for Materials Science, TAKASHI MOCHIKU, SHAN YU, EL HADI SMAIL SADKI, KAZUTO HIRATA — To study the influence of artificial periodic pinning centers on the vortex matter in high- $T_c$  superconductors, we have measured the local magnetization and the electrical resistance of  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+y}$  single crystals with sub-micron holes, which are distributed as a triangular lattice. Both measurements show matching effects in multiples of the matching field calculated from the lattice spacing of the defects array. The maximum field in which the matching effect is observed is larger than the field of the vortex-lattice melting transition in samples without artificial defects. There are several possibilities that is the existence of a kind of vortex liquid phase, which has an in-plane order, or a density matching between vortex liquid and defects lattice.

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