Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Vortex configurations and geometrical shapes of superconducting MoGe networks revealed by scanning SQUID microscope[1] TAKEKAZU ISHIDA, HO THANH HUY, TSUTOMU YOTSUYA, Osaka Prefecture Univiersity, MASAHIKO HAYASHI, Akita University — We prepared square networks of MoGe films by a standard photolithographic technique to observe vortex penetration into the network by means of a scanning SQUID microscope under different conditions of applied magnetic fields and temperatures. We found that vortex distribution in network evolves with applied magnetic field. At half matching field, vortices showed a checkerboard pattern, being in good agreement with theoretical predictions. We also investigated how vortices occupy network holes at different temperatures. Vortices tend to align in a "diagonal" direction at high temperatures while vortices repel each other to become isolated vortices at lower temperatures. Our results are consistent with theoretical calculation for nanoscopic superconducting network using the nonlinear Ginzburg-Landau equation. We also demonstrate that our data processing method appreciably improved a spatial resolution of the SQUID microscope.

[1]This work was partly supported by a Grant-in-Aid for Scientific Research from the Ministry of Education, Culture, Sports, Science and Technology of Japan (Grant Nos. 19206104, 23246173, 23226019).

Takekazu Ishida
Osaka Prefecture Univiersity

Date submitted: 17 Nov 2011 Electronic form version 1.4