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Magnetic Property in Large Array Niobium Antidot Thin Films CHEN TINGHUI, KUNG HSIANG-HSI, LEE WEI-LI, Institute of Physics, Academia Sinica, Taipei, Taiwan, INSTITUTE OF PHYSICS, ACADEMIA SINICA, TAIPEI, TAIWAN TEAM — In a superconducting ring, the total flux inside the ring is required to be an integer number of the flux quanta. Therefore, a supercurrent current can appear within the ring in order to satisfy this quantization rule, which gives rise to certain magnetic response. By using a special monolayer polymer/nanosphere hybrid we developed previously, we fabricated a series of superconducting niobium antidot thin films with different antidot diameters. The antidots form well-ordered triangular lattice with a lattice spacing about 200 nm and extend over an area larger than 1 cm<sup>2</sup>, which enables magnetic detections simply by a SQUID magnetometer. We observed magnetization oscillation with external magnetic field due to the supercurrent screening effect, where different features for large and small antidot thin films were found. Detailed size and temperature dependencies of the magnetization in niobium antidot nanostructures will be presented.

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