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Mechanism of vortex pinning by graded triangular arrays of sub-micrometric defects in a superconducting Nb film T. C. WU, Department of Electrophysics, National Chiao Tung University, LANCE HORNG, J. C. WU, Department of Physics, National Changhua University of Education, JAN KOLACEK, Department of Applied Mathematics, Faculty of Science, Masaryk University, Czech Republic, C. W. HSIAO, Department of Physics, National Changhua University of Education, T. J. YANG, Department of Electrophysics, National Chiao Tung University — We have investigated the periodic pinning of magnetic flux quanta in the Nb films with graded triangular arrays of submicrometer defects. Arrays of pinning centers with a spacing of about 425nm to 375 nm and a diameter of about 250nm were fabricated by the electron beam lithography. In the mixed states, the minima of magnetoresistance and maxima of critical current as a function of magnetic field appear at certain values of magnetic field corresponding to the flux quanta calculation of the lattice spacing of the homogenous ones (400nm). A comparison of will be discussed graded and homogenous triangular arrays.

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