MAR05-2004-000167

Abstract for an Invited Paper
for the MAR05 Meeting of
the American Physical Society

Experimental vortex ratchet in Nb films with magnetic and non-magnetic asymmetric potentials.[1]

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Electron beam lithography allows growing Nb film on arrays of periodic asymmetric potentials. Injecting an ac current in the sample yields a rectified vortex flow. The applied magnetic field and input current strength tune both the magnitude and polarity of the net vortex flow. We will address several points as the temperature and frequency dependence, magnetic pinning centers (Ni) vs. non-magnetic pinning centers (Cu) and the comparison of the behavior of this vortex ratchet system with different types of ratchet as for instance biological motors.

[1]Work supported by Spanish Ministerio Educacion y Ciencia (MAT02-04543 & MAT02-12385E)