

NANORECTIFIERS BASED ON SUPERCONDUCTING/MAGNETIC HYBRIDS

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Films of superconducting Nb have been grown on top of arrays of Ni nanotriangles. In the superconducting mixed state of this hybrid system, the vortex lattice dynamics shows rectification effects [1]. The array of nanotriangles acts as pinning centers for the superconducting vortex lattice. The vortex lattice motion on these asymmetric potentials shows rectification effect. That is, an input ac current applied on the nanodevice yields an output dc voltage. There are two possible rectification effects: longitudinal effect, when the input current is injected perpendicular to the triangle reflection symmetry axis and transverse rectification when the input current is injected parallel to the triangle reflection symmetry axis effect the output voltage drop occurs perpendicular to the triangle reflection symmetry axis [2].

References:

- [1] J. E. Villegas, S. Savelev, F. Nori, E. M. Gonzalez, J. V. Anguita, R. Garcia, J. L. Vicent, *Science*, **302** (2003) 1188.
[2] E. M. Gonzalez, N. O. Núñez, J. V. Anguita, J. L. Vicent, *Applied Physics Letters*, **91** (2007) 062505.