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Vortex ratchet effect induced by different magnetic configurations in magnetic superconducting hybrids.[1] D. PEREZ DE LARA, Universidad Complutense de Madrid(UCM), F.J. CASTANO, Massachusetts Institute of Technology(MIT), B.G. NG, MIT, R.K. DUMAS, University of California Davis(UC-Davis), E.M. GONZALEZ, UCM, KAI LIU, UC- Davis, C.A. ROSS, MIT, IVAN K. SCHULLER, University of California-San Diego, J.L. VICENT, UCM — We have used E-Beam Lithography to prepare hybrid systems consisting of arrays of nanometric Ni rings (elliptical and circular)covered by a superconducting Nb film. These nanometric rings were characterized by a First Order Reversal Curve method to realize the onion and vortex magnetic state at remanence. The transport properties of the superconducting Nb film were measured in the mixed state by applying a magnetic field(H) perpendicular to the sample. Classical pinning matching effects of very high order were observed in resistance vs H, which vary with the magnetic state of Ni rings. Interestingly, a ratchet effect characterized by a dc output voltage produced by an applied ac current is found. Moreover, the ratchet effect is drastically modified by the remanent magnetic state of the Ni rings. The systematic and origin of the ratchet effect will be discussed.

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