Abstract Submitted
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Vortex ratchets from asymmetric weak-pinning channels[1] K. YU, T.W. HEITMANN, C. SONG, M.P. DEFEO, B.L.T. PLOURDE, Syracuse University, M.B.S. HESSELBERTH, P.H. KES, Leiden University — The dynamics of vortex flow in confined geometries can be explored with structured weak-pinning channels of superconducting a-NbGe surrounded by strong-pinning NbN channel edges. The lack of pinning allows the vortices to move through the channels with the dominant interaction determined by the shape of the channel walls. We have fabricated such weak-pinning channels with asymmetric sawtooth edges for controlling the motion of vortices. We present measurements of vortex dynamics in the channels and compare these with similar measurements on a set of channels with uniform width. While the uniform-width channels exhibit a symmetric response for both directions through the channel, the vortex motion through the asymmetric channels is considerably different, with substantial asymmetries in both the static depinning and dynamic flux flow. We report on the rich dependence on magnetic field and driving force amplitude for this vortex ratchet effect.

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