Abstract Submitted
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Local probing of the vortex-antivortex dynamics in superconductor/ferromagnet hybrid structures.[1] J. TEMPERE, V.N. GLADILIN, J.T. DEVREESE, Universiteit Antwerpen, A.V. SILHANEK, J. VAN DE VONDEL, B. RAES, G.W. ATAKLTI, W. GILLIJNS, V.V. MOSHCHALKOV, INPAC, KULeuven — In-plane ferromagnetic bars, parallel to each other and arranged to form a linear array underneath a superconducting bridge, create two types of vortex chains of opposite polarity inside the superconductor. The time-dependent Ginzburg-Landau approach is applied to investigate the dynamics of these vortex chains and the critical current densities, which correspond to the onset of vortex propagation along each chain. As a function of an external magnetic field, the calculated critical currents are strongly asymmetric and manifest pronounced oscillations, which strongly correlate with the field-induced changes in the number of vortices in a chain. The results of modeling are used to interpret the performed local transport measurements, which probe the dynamics of individual vortex channels. This combined theoretical and experimental investigation allows us to explain the most relevant properties of the dynamics of these superconductor-ferromagnet hybrid systems..

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