

Abstract Submitted
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The Dynamics of Multi-Shell Vortex Matter in Mesoscopic Superconducting Corbino Disks¹ VYACHESLAV R. MISKO, NANSHENG LIN, FRANCOIS M. PEETERS, University of Antwerp, Belgium, CONDENSED MATTER THEORY TEAM — The discrete shell structure of vortex matter strongly influences the flux dynamics in mesoscopic superconducting Corbino disks. While the dynamical behavior is well understood in large and in very small disks [1], in the intermediate-size regime it occurs to be much more complex and unusual, due to (in)commensurability between the vortex shells. We demonstrate [2] unconventional vortex dynamics (inversion of shell velocities with respect to the gradient driving force) and angular melting (propagating from the boundary where the shear stress is minimum, towards the center) in mesoscopic Corbino disks. We show that intra- and inter-shell defects in shell structures can lead, correspondingly, to the inversion and hysteresis in the angular velocities of the shells [3]. [1] V.R. Misko and F.M. Peeters, Phys. Rev. B **74**, 174507 (2006). [2] N.S. Lin, V.R. Misko, and F.M. Peeters, Phys. Rev. Lett. **102**, 197003 (2009). [3] N.S. Lin, V.R. Misko, and F.M. Peeters, unpublished.

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Vyacheslav R. Misko
University of Antwerp, Belgium

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