Vortex diffusion in axial quantum turbulence

L. Saluto[a], D. Jou[b], and M.S. Mongiovi[a]

[a]Dipartimento di Energia, ingengneria dell'Informazione e modelli Matematici (DEIM), Università degli studi di Palermo, Palermo, 90128, Italy
[b]Departament de Física, Universitat Autònoma de Barcelona, Bellaterra, 08193, Catalonia, Spain

We study the influence of vortex diffusion on the evolution of inhomogeneous quantized vortex tangles. As an illustration, we obtain solutions for these effects in axial counterflow between two concentric cylinders at different temperatures. The vortex diffusion from the inner cylinder to the outer cylinder increases the vortex length density everywhere as compared with the non-diffusive situation. The possibility of hysteresis cycles of vortex line density under variations of the heat flow is explored.

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