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The Editors,
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APS

Dear Editor,

We are pleased to submit our manuscript entitled **"Experimental and theoretical evidence of universality in superfluid vortex reconnections"** to be considerated for publication in *Physical Review Letters*. This paper presents experimental and numerical insights into the dynamics of vortex reconnections in superfluid helium at zero and non-zero temperatures, with significant implications for understanding the physics of vortex reconnections with respect to energy dissipation/transfer and irreversibility.

For the first time in the study of vortex reconnections, we combine experiments with numerical simulations, finding very good agreement. Our work shows that the scaling law describing the minimum distance between pre and post reconnecting vortices is universal: it is not only valid in Bose-Einstein Condensates (BECs) and classical viscous fluids (as established in previous studies), but also in superfluid helium. As in BECs and Navier-Stokes fluids, superfluid vortices separate faster than they approach each other. This property is related to dissipation of kinetic energy, hence to irreversibility.

We also demonstrate that each reconnection event in superfluid helium injects energy into the normal fluid. By estimating the reconnection frequency and examining energy dissipation, we show that if the vortex line density is sufficiently large, these energy injections can maintain the normal fluid in a dynamically perturbed state.

We believe that our findings will be of interest to readers of *Physical Review Letters*, as they provide a deeper understanding of superfluid dynamics and highlight universal aspects of vortex reconnections across fluid systems.

Thank you for considering this manuscript; we look forward to your response.

On behalf of the authors,

Piotr Stasiak