Erratum: Bacterial Turbulence at Compressible Fluid Interfaces [Phys. Rev. Lett. 136, 138301 (2026)]

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In the original Letter, we inadvertently omitted the citation of a relevant numerical study [1], which was not incorporated during the preparation of the manuscript in its present form. The study numerically investigated collective motion in a 2D system embedded in a bulk fluid. These results, together with earlier theoretical work [2], predicted the role of in-plane compressibility and the resulting instabilities and collective motion states in active fluids. Our experimental results provide independent experimental verification of the numerical predictions, including the saturation of vortex size with system height and its qualitative difference from bulk systems.

We also wish to clarify that the theoretical derivation presented in our Letter is rooted in the mean-field kinetic theory (MFKT) framework developed by Skultty *et al.* [2], here extended to fluid interfaces with finite film thickness. While [2] was cited in Supplemental Material, its foundational role was not explicitly acknowledged in the main text.

Specifically, on page 3, the citation [2] should be inserted in the following passages:

We employ mean-field kinetic theory (MFKT) to elucidate the qualitative distinctions in length-scale selection between interfacial and bulk (2D or 3D) bacterial turbulence.

While the governing equations for the probability density are formally identical in the P2D and I2D systems [Eq. (D1)], the resulting dynamics differ because the flow fields, entering through Eqs. (D2) and (D3), determine the translational and rotational motion of bacteria.

[1] D. Bárdfalvy, V. Škultéty, C. Nardini, A. Morozov, and J. Stenhammar, Collective motion in a sheet of microswimmers, Commun. Phys. **7**, 93 (2024).

[2] V. Škultéty, D. Bárdfalvy, J. Stenhammar, C. Nardini, and A. Morozov, Hydrodynamic instabilities in a two-dimensional sheet of microswimmers embedded in a three-dimensional fluid, J. Fluid Mech. **980**, A28 (2024).

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