

Corrigendum to “Positive resolution of Bartnik’s cosmological splitting conjecture”

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In [3] we announced a positive resolution of Bartnik’s cosmological splitting conjecture. Unfortunately, our argument was based on a false premise concerning a construction of Zhu, Wu and Cui [4], which examines the limit of the Lorentzian distance to the level sets of an h -steep temporal function, where h is a Riemannian metric completely metrizing a cosmological Lorentzian spacetime. More specifically, in [3, Prop. 2.2] (which recapitulates [4, Lem. 3.2] and its consequences), it is claimed that this family of distances and its limits are locally equi-Lipschitz. However, an example contradicting this claim appears in Ehrlich and Galloway [1]. The existence of such examples invalidates our conclusions. We are grateful to Greg Galloway for drawing this error to our attention; see [2] for further counterexamples and discussion.

References

- [1] P. E. Ehrlich and G. J. Galloway. Timelike lines. *Classical Quantum Gravity*, 7(3):297–307, 1990.
- [2] G. J. Galloway, R. J. McCann, and A. Ohanyan. Failure of equi-Lipschitzness for families of Lorentz distances to Cauchy surface foliations. *In preparation*.
- [3] R. J. McCann and A. Ohanyan. Positive resolution of Bartnik’s cosmological splitting conjecture. *arXiv:2606.03873v1–v2*, 2026.
- [4] S. Zhu, H. Wu, and X. Cui. Global viscosity solutions to Lorentzian eikonal equation on globally hyperbolic space-times. *J. Differential Equations*, 435:Paper No. 113323, 30, 2025.

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