

Erratum: Can we predict the weather? New tools for an old problem [Phys. Rev. Fluids 10, 083801 (2025)]

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We thank Professor David Schultz for performing a critical reading of our paper, for bringing the issues addressed below to our attention, and for providing useful references. Following his comments, we report several corrections and clarifications to our original paper. None of the corrections influences the conclusion of the paper.

(1) In the Abstract, as well as in the Introduction, the sentence “In the late 1950s and 1960s, Lewis Fry Richardson, and later, Edward Lorenz,” should be rephrased as “Lewis Fry Richardson, in the 1920s, and later, Edward Lorenz, in the 1960s, ...”

(2) In Sec. I, the phrase “predicting the weather reliably” should be rephrased as “predicting the small-scale weather phenomena (such as thunderstorms) reliably.”

(3) In Sec. II A, the paragraph *In winter, the sun’s rays are mainly perpendicular to the ground in the Southern Hemisphere, while they are more tangential in the Northern Hemisphere. As a result, the Southern Hemisphere receives more heat from the sun than the Northern Hemisphere, the converse being true in summer. Moreover, in general, sun rays are more tangential at the pole than at the equator. As a result, more heat reaches the ground at the equator than at the pole, resulting in a temperature difference between the equator and the two poles* should be substituted by: **Due to the specificities of the Earth’s orbital parameters, the equator receives on average more heat than the poles, resulting in a temperature difference between the equator and the two poles.**

(4) In Sec. II A, the statement “**double** Rayleigh-Bénard **cell**, glued together,” should be rephrased as “**two** Rayleigh-Bénard **setups**, glued together.” Due to rotation and other processes like humidity, etc., the resulting circulation is actually more complicated than what is usually observed in simple Rayleigh-Bénard experiments.

(5) In Sec. II B, the words “acting in a spherical shell of inner radius O (6000 km) and width O (1 km)” should be substituted with “acting in a spherical shell of inner radius O (6000 km) and width O (10 km),” which is the number quoted in Sec. II F, when we compute the resolution needed for the weather forecast.

(6) In Sec. II C, it should be noted that scientific forecasting had already started in the 1910s such as the case for [1].

(7) In Sec. II C, the sentence “Lewis Fry Richardson, launched the first weather revolution in a book **named** “Numerical Methods for Weather Predictions” should be substituted with “Lewis Fry Richardson, launched the first weather revolution in a book **about** numerical methods for weather predictions.” The exact title is provided in Ref. [2] of our paper.

(8) Lewis Fry Richardson himself was influenced by other authors, like Abbe [2] and Bjerknes [3].

(9) The forecast factory by itself was never implemented. The sentence “The first tests of the machine were not very conclusive” refers to the test of Richardson himself, subjected to the procedure (manual computation of the weather discretized equations). The resulting weather

forecast was wrong because the initial conditions had unrealistically large high-frequency gravity waves in the initial conditions. To Richardson's eyes, the failure was not that the prediction was wrong, but rather that it took him several weeks to manually do a 6 h forecast, thereby explaining his sentence (quoted in the end of Sec. IC) *perhaps some day in the dim future it will be possible to advance the computations faster than the weather advances*

(10) In Sec. IIE, the sentence "This storm is part of a derecho [3], a *train* of deadly storms," the word **train** should be substituted by the word **line**, as in the caption of Fig. 1.

(11) In Sec. IIE, in the phrase "that propagate usually in a straight line from southwest to **northwest**," **northwest** should be **northeast**.

(12) In the caption of Fig. 1, the phrase "the snapshot is taken as several *derechos* aggregate" should be substituted by "the snapshot is taken as several *storms inside the derechos* aggregate." The opening words "Line of derechos" should be substituted by "The derechos." Finally, the word "trajectory" refers to the trajectory of the aggregate.

(13) In Sec. III, the bold font words need to be added to the sentence, "as we saw in the Corsican storm, these tools are still limited **for predicting the precise timing, location, and intensity** in the case of severe hazards."

[1] V. Bjerknes, Weather forecasting, [Mon. Weather Rev.](#) **47**, 90 (1919).

[2] C. Abbe, The physical basis of long-range weather forecasts, [Mon. Weather Rev.](#) **29**, 551 (1901).

[3] V. Bjerknes, The problem of weather prediction, considered from the viewpoints of mechanics and physics, *Meteorol. Z.* **21**, 1 (1904).