CORRIGENDUM

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This corrigendum addresses two issues in the paper by Archer et al. (2020): an incorrect version number and a clarification.

The first issue is the incorrect version number of the Weather Research and Forecasting (WRF) Model in which the code bug occurred for the first time, which is v3.6, not v3.3 as stated or implied in the manuscript. The following is a brief history of the treatment of QKE (a WRF array variable that is defined as twice the turbulence kinetic energy), QKE_ADV (a second array that stores QKE to be advected), and the namelist flag *bl_mynn_tkeadvect* (directly related to the code bug) throughout early WRF versions:

- v3.3: QKE is defined as "scalar," so it was properly advected. This is the first version in which the Fitch parameterization was included.
- v3.4: Same as v3.3.
- v3.5: QKE was redefined as "misc" and the flag *bl_mynn_tkeadvect* and the scalar variable QKE_ADV were introduced. No code bug was present.
- v3.6: Same as v3.5, but the code bug was introduced because several key lines of code were removed.
- v3.7–v4.2: Same as v3.6.
- v4.2.1–current: The bug is fixed and C_{TKE} is reduced as recommended by Archer et al. (2020).

Five sentences were affected directly or indirectly by this imprecision and should, therefore, be rephrased as follows (new text underlined):

1) Abstract: "All WRF simulations that used the Fitch wind farm parameterization since WRF v3.6 are affected, and their conclusions may need to be revisited."
2) p. 4823: "However, as described in sections 2b and 2c, a code error (i.e., "bug") and the excessive value of a coefficient seriously affected any results obtained with the Fitch parameterization since WRF v3.6."
3) p. 4824: "In the first implementation of the MYNN2 PBL scheme (WRF v3.2), as well as in the default configuration of the MYNN2 PBL scheme since v3.5, there is no horizontal advection of TKE from one column to another because TKE is not passed further to the transport schemes (i.e., horizontal and vertical advection and diffusion)."
4) p. 4824: "However, starting in v3.6, a code bug is present when the flag *bl_mynn_tkeadvect* is set to true, such that the scalar array QKE_ADV is not properly updated, as described in section 3b."
5) p. 4826: "Let us consider next the case in which the flag *bl_mynn_tkeadvect* is set to true. This flag was introduced in WRF v3.5 [. . .] and it was recommended to be set to true if the Fitch wind farm parameterization is to be used. The idea behind it was to have a new scalar array, called QKE_ADV, that stores QKE after it is updated by the various PBL scheme processes and that is passed to the WRF dynamic core to be advected and mixed around in the domain at all grid cells and not just those with the wind farm. However, starting in v3.6, because of the bug, QKE at the wind farm cells(s) includes the TKE generated by the wind farm in the Fitch parameterization but QKE_ADV does not because QKE_ADV is not updated after the call to the *module_wind_fitch.F* (Fig. 1a)."

The second issue is a clarification. We already pointed out that "no error is present in the Fitch parameterization per se, but rather in the way it is inserted in the WRF computer code" (p. 4826) and that "in the default setup of the Fitch parameterization, the turbulence in the wake cannot be advected

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around horizontally in the domain, not because of a fault in the Fitch parameterization itself, but rather because TKE is not advected by default with the MYNN2 PBL scheme'' (p. 4824). To further emphasize that there is no code error in the Fitch parameterization, two other sentences should be rephrased as follows:

1) Abstract: ''The first issue is a simple ''bug'' in the WRF code, not in the Fitch parameterization, and the second issue is the excessive value of a coefficient, called C_{TKE}, that relates TKE to the turbine electromechanical losses.''
2) Conclusions, p. 4834: ''A code bug in the way the Fitch parameterization is inserted in the WRF code (not in the Fitch parameterization) and the incorrect neglect of electromechanical losses are the reasons for the incorrect treatment of TKE in the WRF Model when the Fitch parameterization is turned on.''

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REFERENCE

Archer, C. L., S. Wu, Y. Ma, and P. Jiménez, 2020: Two corrections for turbulent kinetic energy generated by wind farms in the WRF Model. *Mon. Wea. Rev.*, **148**, 4823–4835, https://doi.org/10.1175/MWR-D-20-0097.1.