Review of Mouhali et al., egusphere-2026-2829

GENERAL

This manuscript is the result of a lot of analysis, which has been clearly explained. The Discussion and Conclusion sections are fair and balanced. The COMMENTARY below offers some detailed points for consideration by the author. The paper is up to the standards of *Nonlinear Processes in Geophysics.*

COMMENTARY

Lines 3-4: The form of words "tornado path length", L, is clear and unambiguous. However, there are places in the text where it has been shortened to "tornado length", an unmeasured quantity that could be mistaken for a distortion of "tornado diameter", also unmeasured as far as this manuscript is concerned - or is it what is meant by W? Please clarify.

Line 7: Again, what is meant by "longer tornadoes"? I assume you mean "tornadoes with longer paths" but the language is imprecise.

Line 12: ..... several decades in scale. I presume this means time or time scale. Clarify.

Lines 18-19: One of several examples - replace "tornado length" by "tornado path length".

Lines 28-31: Indeed. See *Entropy* **2025**, *27*(7), 740;https://doi.org/10.3390/e27070740 for a recent perspective. Reference and [42] therein is relevant.

Lines 72-78: See the above reference for some discussion of the energetics of wind generation.

Lines 90-93: Presumably A is for area. Please say so explicitly.

Lines 133-135: Yes, important to establish the result. Insert "path" between "longer"and "path".

Lines 138-148: The tornadic vortex will have a radial velocity gradient, which at some point will cease to cause damage but still be recognisably elevated above what existed prior to the tornado's propagation into the region. Please discuss.

Lines 150-159: Bear in mind that the kinetic energy of the wind is a very small fraction of the total internal and gravitational energy, as pointed out for example in the books of Gill, *Atmosphere-Ocean Dynamics,* (1982), page 75, and Dutton, *The Ceaseless Wind: An Introduction to the Theory of Atmospheric Motion,* 2nd Edition, (1986), Chapter 14. Some brief discussion would help the reader.

Line 181: "substantial intrinsic scatter"- does the variance converge? Figure 1 suggests that it doesn't. Many readers will look at the straight line fitted to the data points and ask what value it has, lines 185 and 186 notwithstanding.

Lines 219 et seq.: Generally a great deal of high quality data is required to evaluate $q > 2$. Do you have it?

Lines 253-254: Lognormal distributions are not in general the same thing as the fat-tailed distributions seen in atmospheric data.

Lines 373-374: Figure 8 looks to my eye to have significant structure with positive convexity between $1.0 < q < 2.5$.

Lines 469-473: I recommend including Reference [42] from *Entropy* **2025**, *27*(7), 740;https://doi.org/10.3390/e27070740