Characteristics of the Derived Energy Dissipation Rate using the 1-Hz Commercial Aircraft Quick Access Recorder (QAR) Data

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REVIEW

GENERAL COMMENT:

The paper provides a nice and detailed analysis of energy dissipation rate (EDR) calculated with several approaches using 1 year of data collected by two commercial aircrafts. The paper is well written, the figures generally well made (but please see my comments below), and the analysis is explained in detail. While this reviewer is not an expert in aviation meteorology, I am sure the topic is of great interest for the community. My review focused on the turbulence calculations and boundary layer meteorology aspects of the analysis, and from that point of view I find the paper worth of being accepted after minor revisions.

MAJOR COMMENTS:

1. Most of the abstract explains the methodology applied to derive EDR, which are not novel or unique to this analysis. I recommend re-shaping the abstract so that more focus is given to the results of this analysis, and especially its novelty aspects compared to previous studies in the same field.
2. P. 6 l. 22: how did you select the “predefined inertial range”? Was this selection valid at both high and low turbulence regimes? At all heights? For both aircrafts? This is critical choice that impacts the EDR calculation, and therefore should be explained in more detail.

SPECIFIC COMMENTS:

1. P.2 L.22: should be “Southwest”. Also, these references to commercial airlines probably require a citation.
2. P.4 L.5: The following sentence is confusing and somewhat misleading; you should just say that the B737 data were recorded at 0.25 Hz. The same type of misleading information is used many times in the rest of the paper. “The aircraft flight parameters used in the current 5 study were recorded every second (1 Hz) for both the B737 and B777. Because the 1-Hz wind direction and wind speed of the B737 records had the same values within a 4-second time window, the wind direction and wind speed of the B737 records seem to have 1/4-Hz sampling frequency.”
3. P. 6 L. 3: please delete the following sentence as you have already stated this piece of information: “(264,867 and 1,065,855 reports from B737 and B777 recorders, respectively)”.

4. Eq. 5: please define what the brackets “< >” mean.
5. P. 15 L.2: missing “)”.
6. P.16 L. 6: “and so on” is not appropriate for a scientific paper, please rephrase.
7. Figures 9, 11, 13: can you consider using a log scale on the y-axis of panels b, c, and d? Right now, the plots are very hard to read.
8. Figure 12: it’s hard to see the black circle(s), please use a different color.
9. Throughout the paper, please consider using a different color scheme. The rainbow color has quite a lot of issues, see for example https://www.climate-lab-book.ac.uk/2014/end-of-the-rainbow/