

This is a very interesting study and this reviewer enjoyed reading the manuscript. The manuscript should be ready for publication in *Annales Geophysicae* after minor revision. Below are the specific comments.

We thank the referee for the detailed reading of our manuscript and constructive comments. We have revised the paper accordingly. Our detailed responses are found from below.

1. Page 3, line 11: Riazantseve et al. (2019) used WIND MFI magnetometer data: the SPEKTRR spacecraft does not yield magnetic-field data.

We have revised the text accordingly. Thank you for pointing this out.

2. Page 7, line 15: Please add to the manuscript the formula for how $\delta B/B$ is obtained in the time-series data.

We have defined this now in the text.

3. Page 7, line 21: The reviewer does not understand the statement “, consistent with the absence of strongly compressive fluctuations.” Please elaborate on this in the manuscript.

We have modified this part and explain this now in more detail in the beginning of the subsection.

4. Page 8, line 15: What is “the ion cyclotron timescale” and how is it calculated? Isn't the relevant timescale in the spacecraft frame the Doppler-shifted ion gyroradius?

We have detailed this in the text.

5. Table 2, and elsewhere: Using only 1 hour of data, can you estimate the statistical uncertainty in you value of the inertial-range spectral index? For instance, if you compare your answer to the answer you get for the adjacent hour of data, how big is the variation? Can you comment in the manuscript about whether or not the method you use to obtain the spectral index has less statistical noise than fitting a power spectral density does.

The use of 1-hour region was based on selecting regions of CME sheaths where fluctuations are generated primarily by certain physical mechanisms (e.g., near leading edge by processes associated with draping and expansion of the ejecta). We have however added now the errors from the fitting procedure to the table. We are not aware of exact comparison of noise compared to fitting to PSD but would expect it to be less. We have explained this part now in more detail and refer to Matteini et al., 2018 and Good et al., 2020 as examples of studies where this approach has been applied before.