Dear Editor,

Thank you very much for your attention and the comments from the referees about our manuscript entitled "**Evolution of turbulent kinetic energy during the entire sandstorm process**" (acp-2021-889), submitted for publication in *Atmospheric Chemistry and Physics*.

We have carefully considered all suggestions from the referees and checked for typos and terminology during the preparation of the present revised version of the manuscript. Changes in the revised manuscript are marked in blue. Point-by-point replies to each referee are provided in the "Response to Referee x". In addition, there are no missing co-authors and their affiliations, updates of data in tables, or updates of variables in equations.

We sincerely hope this manuscript will be finally acceptable to be published in *Atmospheric Chemistry and Physics*. Thank you very much for all your help and looking forward to hearing from you in due course.

Response to Referee 1

Suggestion: There are some places in the point-to-point replies need to be explained further. Please check the abscissas and ordinates of Figure R3 and R4, and give some explanations.

Reply:

Thanks for the reviewer's suggestion. To respond to the "Specific Comment 1" on the original draft of Referee 2, the author studied and discussed the uncertainty of these choices (the IST threshold (30%), the time window used for initial

time-averaging (1 hr), and dt (5 min)) in final results. Following the reviewer's suggestion, a sensitivity test was performed to answer this question. Figure R3 is the size of segments for different time windows (40 min, 60 min, 80 min) used for initial time-averaging. Figure R4 is the size of segments for different dt (4 min, 5 min, 6 min). Therefore, the abscissas represent each segment of the signal after performing the segmentation method, and the ordinate represents the time length of each segment of the signal. For example, in Figure R3, the three bars corresponding to "Part 2" on the abscissa represent the time length of the second segment after performing the segmentation method using the initial time-averaging of 40 min, 60 min and 80 min, respectively.

Response to Referee 2

Suggestions for revision:

1. In response to my "Specific Comment #6" on the original draft, the authors included the location where the fraction is reported (i.e., $z/\delta = 0.2$) throughout the text. At least in the abstract, and preferably other places, I suggest adding some text providing context and describing the physical location of this point. That is, what is the significance of the location $z/\delta = 0.2$?

Reply 1:

Thanks for the reviewer's suggestion. The location where the fraction is reported (i.e., $z/\delta = 0.2$) corresponds to approximately the top of the logarithmic region. The authors have added some text providing context and describing the physical location of the point of $z/\delta = 0.2$ in the revised manuscript, i.e.,

"…can reach up to 75% at approximately the top of the logarithmic region ($z/\delta = 0.2$) in the present ASL observation…"

Please see lines 291–292 on page 12 in the revised manuscript.

2. Line 26: Please rewrite the new sentence “Wind velocity …”, or perhaps remove “hence decisively”.

Reply 2:

Thanks for the reviewer’s suggestion. In the sentence, “hence decisively” has been removed and modified as “Wind velocity has been proven to have a more significant impact on sandstorm than other meteorological elements.”

Please see lines 26–27 on page 2 in the revised manuscript.