

Atmos. Chem. Phys. Discuss., referee comment RC2
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Comment on acp-2022-76

X.-L. Cheng (Referee)

Referee comment on "Impact of turbulence on aeolian particle entrainment: results from wind-tunnel experiments" by Jie Zhang et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-76-RC2>, 2022

The authors designed a novel technique in wind tunnel to measure the entrainment rate of various particle sizes under different flow conditions. They show that quasi-convective turbulence increases the surface shear stress and hence substantially enhances the entrainment of sand and dust particles. It is a very novel experiment design, and the results are very enlightening.

Comments:

The authors analyzed the power spectrum and PDF of the quasi-convective turbulence, and believed it is similar to convective eddies in atmospheric boundary layers. But from the generation way, the quasi-convective turbulence is more like a kind of coherent structure observed in the atmospheric boundary layer (Liu and Zheng, 2021). Please give some explanation and discussion.

In line 119-123, how to get z0ABL?

In line 141, should “ $z < 0.2\text{m}$ ” be “ $z > 0.2\text{m}$ ”?

Reference

Liu, H. Y. and X. J. Zheng, 2021. Large-scale structures of wall -bounded turbulence in single- and two-phase flows: advancing understanding of the atmospheric surface layer during sandstorms. *Flows*, 1 E5.