

Atmos. Meas. Tech. Discuss., author comment AC1
<https://doi.org/10.5194/amt-2022-69-AC1>, 2022
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Reply on RC1

Guanglie Hong et al.

Author comment on "Performance evaluation of an A band differential absorption LIDAR model for the ocean surface pressure from low-Earth orbit" by Guanglie Hong et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2022-69-AC1>, 2022

□1□ With regard to the "global production NWP model unit size, our work seems to have regressed to the measurement size of 44km", not only to meet the needs of eliminating measurement noise, but also based on the empirical data of laser remote sensing instruments that have been launched internationally, which is limited to the emission capacity of spaceborne lasers (repetition frequency multiplied by pulse energy), The satellite borne wind laser optical radar ALADIN of the ADM-AEOLUS mission launched by the European Space Agency in 2018, the laser repetition frequency is 50Hz, the average time of laser pulses is 7s, and the gap period is 21s. The original design orbital height is 408km, and the along orbit laser pulse accumulation horizontal distance unit is 50km (plus the upper span 200km horizontal distance resolution). The actual orbital height after liftoff is 320km, the laser pulse energy is 72mJ, and the along orbit accumulation distance unit is ~88km, It is more than 50km of the original design. Just referring to the actual capability of ALADIN, we propose a 6.25s pulse accumulation time, and the corresponding horizontal distance measurement unit is 44km.

□2) "For typical/specified LEO orbits, how many samples on land belong to the category where the height change is less than 2 meters in any 44 km or other path length. How to introduce this constraint in this type of error analysis, how many samples are needed and where?"

In order to make the height change more rigorous, the manuscript will make major changes to this, and the title "Performance evaluation of an integrated path different absorption LIDAR model for surface pressure from low Earth orbit" will be changed to "Performance evaluation of an integrated path different absorption LIDAR model for local surface pressure from low Earth orbit", The text will delete the content about "land". The text will not discuss the situation of land surface temporarily, which has made the discussion more simple. The atmospheric pressure of sea surface is very important for weather forecast.

□3) The relationship between differential optical thickness and atmospheric pressure in the past literature is reviewed.

Please also note the supplement to this comment:

<https://amt.copernicus.org/preprints/amt-2022-69/amt-2022-69-AC1-supplement.pdf>