

**Review of “Tropospheric ozone sensing with a differential absorption lidar based on single CO<sub>2</sub> Raman cell” by Fan et al.**

This manuscript “Tropospheric ozone sensing with a differential absorption lidar based on single CO<sub>2</sub> Raman cell” describes a useful differential absorption lidar and its application in ozone measurement. In general, this work is valuable and interesting, but it needs to be improved further. I recommend the paper for publication after the following comments have been addressed.

**General comments:**

1. “Considering the influences of aerosol interference and statistical error, a wavelength pair of 276 nm-287 nm is used for the altitude below 600 m and a wavelength pair of 287 nm-299 nm is used for the altitude above 600 m to invert ozone concentration.” Why do you choose 600 meters as the threshold value to analyze the ozone vertical characteristic? Please explain in detail.
2. L330: It is suggested first to describe the shortcomings or problems still unresolved in this type of LiDAR, then expand to future work.
3. References are few and old. Please add more recent related references.

**Specific Comments:**

1. Line 27 “B. Koo et al.,2012” should be “B. Koo et al.,2012”.Please carefully check the format of cited references throughout the manuscript.
2. Line 80: may not be correct. ‘i’ is not mentioned in the context. Thus ‘i’ should be changed to “on” or “off”.
3. Line 95: ‘It is’ should be ‘it is’.
4. Line 108 “2” in “(e-20 cm<sup>2</sup>)” should be subscript. Please check the formats throughout the manuscript.
5. Line 125: “According to (5)” should be “formula (5)”.
6. Line 132: The font in Figure 2 is indistinct. It is suggested to redraw the picture.
7. Line 174: Figure 3 is small. It is suggested to adjust the size.
8. Line 215: ‘In addition, The aerosol’ should be ‘In addition, the aerosol’.
9. Line 222: “relatively high concentration levels...” Please specify the concentration values or ranges.

10. Line 230: There is a space between them and 'aerosol' and should be deleted.
11. Line 285: Figure 12 is a bit small and distorted and it is proposed to be redrawn.