This manuscript proposed a simple algorithm to retrieve the aerosol optical depth (AOD) over land for the AVHRR sensor based on the dark target approach. First, an empirical relationship between the reflectances at 2.1 microns and 3.75 microns is used to connect the reflectances at 3.75 microns and 0.64 microns; next, an aerosol scattering Look-up-Table is employed to perform the AOD retrievals. Comparisons between the AOD retrievals and the limited AERONET observations show a rather good correlation over a small region (Beijing, China). The authors conclude that this method may be applied to AVHRR AOD retrievals over land surfaces.

Retrieving the AOD over land is an important issue in quantitative land remote sensing and this manusript has provided a potentially useful empirical approach. Although I do not have major critiques of the manuscipt, the presentaion especially the algorithm description part should be improved to help the readers comprehend the approach. The manuscipt can be published after the following corrections/clarifications.

1. page 2229, lines 20-24: I think this long sentence is ambiguous and difficult to understand. Try to split it into two or three shorter ones to be clearer.

2. page 2231, paragraph 1 below Eq.(1): Shouldn't the total reflectance at TOA = R(atmosphere)+R(Earth surface)? If so, line 11 "…, R_TOA(…) is the contribution of the Earth surface to the TOA reflectance" would be incorrect; instead, R_TOA(….) should be the total reflectance which includes the contributions from the land and the atmospheres. Clarify this.

3. page 2231, lines 13-14: Is there any Rayleigh scattering and aerosol scattering interactions? Neglecting such a multiple scattering effect would have any effects on your AOD retrieval results?

4. page 2231 lines 20 to page 2232 line8: To assist readers unfamiliar with this topic, more detailed equations are needed to fully describe your AOD retrieval model. Specifically. the expressions of T1(lambda, miu0), T2(lambda, miu0) and s(lambda) etc.

5. Abbreviations such as the BAER (line 21, page 2231))and LACE-98 (line 7, page 2232) should be given their full names for their first appearance in text to help the reader.

6. page 2232, lines 19-21: If you assume the TOA reflectances at 2.1 and 3.75 microns are equal to surface reflectances, you must have assumed the atmospheric contributions can be neglected. Is there any reference to support this assumption?

7. page 2232, lines 24-25: You mentioned Eq.(7) is the reflectance of 3.75 microns yet you actually used radiance in Eq. (7), why? What's the relationship between the radiance and reflectance in this manuscript?

8. page 2233, line 2: "B(3.75micron) is the Planck function at 3.75 micron," what is the parameter T (temperature) in this Planck function and how to obtain its value?

9. page 2233, Eq. (8): How was Eq. (8) obtained?

10. page 2233: What is the relationship between R(3.75micron) and R'(3.75micron)? Are they the same quantity?

11. page 2234, 1st paragraph: The "simplified LUT method, adopted from BAER algorithm…" should be briefly described here.

12. Figs.4 and 5: You mentioned MODIS channel 0.66 microns (or 660 nm) in Fig. 4's caption yet in Fig. 5 the MOD09 reflectance is labelled as 670 nm.

13. page 2235 and Fig. 7: You included the humidity data here here but I don't see much discussion on this. These data are used to support which of your conclusions?

14. Why there is no cloud masking algorithm applied to improve the retrievals?

15. Fig. 6: AVHRR AOD (640nm): AVHRR TOA reflectance has calibration issue in this region? How was this "line" formed?