

Response to Referee #2

General Comments:

The manuscript explored the biomass burning induced surface darkening effects and the climate feedback on regional meteorology in eastern China combined with satellite retrievals and WRF-Chem simulations. The paper fits the scope and deserves to be published in this journal with minor revisions.

Response: We appreciate for the professional review on our article. According to the suggestions, we will make extensive corrections to improve the manuscript, the detailed corrections are listed below.

Specific Comments:

1. *Line 12-13: "Satellite retrievals show that surface in the near-infrared broadband)." This sentence is unclear. Do you mean the decreased surface albedo (-0.16) appears in the harvest season than other seasons? Please rewrite this sentence.*

Response: Thanks for pointing it out. Based on satellite retrievals, sharp surface albedo declines are found over fire prone areas. And the scope of declines in the near-infrared broadband is the most significant, which can be up to -0.16. It is consistent with the outstanding capacity of near-infrared band to separate the signals between vegetation and charcoal, as demonstrated by previous studies (Jin and Roy, 2005; Trigg and Flasse, 2000).

2. *Line 17: The same as above. What do you mean of later afternoon, should be rewritten more accurately.*

Response: Thanks for the suggestions. The 'later afternoon' here referred to the time after 14:00 until the sunset. It will be rewritten more accurately in the revised version for clarity.

3. *Line 29-33: The sentence is too long and hard to follow. Please revise to short sentences.*

Response: Accepted. The sentence will be rephrased in the revised version.

4. *Line 37-41: As above, please shorten the sentence.*

Response: Accepted. The sentence will be shortened in the revised version.

5. *The multi citations in this manuscript should be separated by blank space.*

Response: Accepted. All citations in the manuscript will be separated by blank space in the revised version.

6. *Line 42: Grammar mistake for “a decrease”. The form “a” is rarely used in front of “decrease”. The sentence can be rewritten as “such decreased surface albedo depends...” or “such surface albedo decline depends...”*

Response: Accepted. Thank you very much for pointing it out and we will correct it accordingly.

7. *Line 48-49: Suggested to delete “in estimation”*

Response: Accepted.

8. *Line 50-51: Delete “Owing to.....maize,”*

Response: Accepted.

9. *Line 53-54: The sentence can be revised as “farmers, who are eager to deal with tons of wheat straw, always resort to burning on spot rather than taking them as fuel.*

Response: Accepted. This revision will be made for clarity.

10. *Line 56: Please be careful to follow the format of this journal. (Ding et al., 2013a; 2015a, 2015b).*

Response: Accepted. We were really sorry for our careless mistakes. Article citation format will be carefully checked in the revised version.

11. *Line 69-70: Shorten the sentence.*

Response: Accepted. The sentence will be shortened in the revised version.

12. Line 71: Should be revised as “decreased surface albedo or surface albedo decline”. Similar changes throughout the manuscript.

Response: Accepted. Similar expressions will be modified in the revised version.

13. I suggested that the introduction section should be reorganized or revised by native editors.

Response: Accepted. We will reorganize the introduction section. In addition, more detailed statements of situations in China and relevant previous studies will be added to make the background clearer.

14. Line 84: (MOD09A1), the other similar changes should also be revised.

Response: Accepted. Similar changes for MODIS datasets will be done in the revised version.

15. Figure 1 b-c. The color bar of Figure 1b and 1c should be labeled (units)

Response: Accepted. The physical quantity of the color bar is a ratio, ‘surface albedo’. The unit and related indication will be added in the revised version.

16. In Figure 3, the wavelengths for shortwave and near-IR should be given.

Response: Accepted. The sentence will be shortened in the revised version.

References

Jin, Y., and Roy, D. P.: Fire-induced albedo change and its radiative forcing at the surface in northern Australia, *GEOPHYS RES LETT*, 32, 10.1029/2005gl022822, 2005.

Trigg, S., and Flasse, S.: Characterizing the spectral-temporal response of burned savannah using in situ spectroradiometry and infrared thermometry, *INT J REMOTE SENS*, 21, 3161-3168, 10.1080/01431160050145045, 2000.