

***Interactive comment on* “Characterizing the 2015 Indonesia Fire Event Using Modified MODIS Aerosol Retrievals” by Yingxi R. Shi et al.**

Anonymous Referee #1

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Review of “Characterizing the 2015 Indonesia Fire Event Using Modified MODIS Aerosol Retrievals” by Shi et al. Based on the Indonesian fire and smoke event in 2015, the paper identified the problems in the MODIS DT aerosol algorithm, and proposed solutions to further improve the global DT algorithm. The paper is well written with sufficient technical information and the improvements to the algorithm is evidently clear. I have conducted similar investigation to the VIIRS aerosol products and algorithm, and found very similar results with the VIIRS aerosol algorithm that is based on MODIS heritage DT algorithm. I think the paper outlined a very important issue with the current operational satellite aerosol algorithm, and the proposed improvements are really important for the satellite aerosol remote sensing community. I found the paper suitable for ACP and I recommend its publication in current format. I only have a few

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minor comments and suggestions for consideration: 1. Page 3 Line 25, Equation 1: Better have bracket to avoid any potential confusions 2. Page 4 Section 2.2: DB algorithm is introduced here. It will be nice to briefly mention how this study will make use of the DB algorithm for comparison. For example, similar to the last paragraph in Section 2.3. 3. Page 20 Table 1: highlight less absorbing in the 'Regional Smoke' model name, maybe 'Regional Less Absorbing Smoke Model'? 4. Figure 2 is very interesting. DB product also missed quite some retrievals in comparison to DT product. Is it attributable to their different cloud screening? From the RGB image, it looks like to me that DT is sort of underscreening clouds but DB is overscreening. Very intriguing. It seems AI which uses UV channels has a better coverage when aerosols are above clouds. I wonder what OMI AOD will look like for the same scene. 5. Figure 2(e) and (f): it will be nice to put 'NDVI' title on the figure same as you did for (a) to (d) 6. Figure 2: do we have similar Figure 2(g) that shows where in-land water test failed? 7. Figure 8 needs legends in addition to your caption descriptions 8. Figure 9: Are there any bin that blue bars are actually taller than red bars? If yes, you may consider using transparency 9. Figure 10: Why this Figure cannot use the same colorbar as the conventional rainbow colorbar in Figure 2 (c)? 10. It will be nice to show how many missing retrievals are due to cloud overscreening and how many are due to in-land water overscreening, in a Table or in a chart

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