Reviewer 1:

This study assessed the application of different viewing geometries for a pair of geostationary imagers, AHI-AGRI and AHI-AMI to retrieve aerosol top height (ATH) information. The stereoscopic algorithm is presented, which converts the lofted aerosol layer parallax, calculated using image-matching of two visible images, to ATH.

During the reviewing process, the main following improvements have been done:

- The retrieval algorithm has been changed: Extinction weighted mean height has been generated.
- Error analysis has been conducted.

However, error analysis results (figs. AR1-AR4 + discussion) were not included into the manuscript. Those changes allow considering the manuscript for publication in the AMT, after following comments have been addressed:

• including error analysis results into the manuscript

Thanks to your suggestion, we now included error analysis results and discussions in Section 5.1.2 "Long-term comparison with CALIOP" (L394-424). Also, the results are also mentioned in conclusions.

• thorough revision of the references. E.g., Kim et al., 2008, Lim et al., 2018, Zoogman et al., 2011, Merucci et al., 2016, ets., are missing in References.

Thanks for checking and sorry for the missing reference. References are corrected as follows:

- ✓ Published year of Zoogman et al. in the manuscript was corrected to 2017.
- ✓ Merucci et al., 2016 is added to the References.
- ✓ Kim et al., 2008 is added to the References.

• Last access date should be added to all web links (e.g., KALION, Line 155)

Last access date is added as (http://www.kalion.kr, last access: 29 March 2023).

last access date for NMSC INR report is added as (https://nmsc.kma.go.kr/homepage/html/satellite/quality/selectQualityGk2a.do, last access: 29 March 2023),

Reviewer 2:

The authors have clearly done quite a bit of work in response to the comments. We really appreciate the effort. However, looking at the scatter plots compared to the moving window correlation coefficient plots things are still unclear as to the skill of the retrieval. So in the moving window shows lower RMSD for higher correlation (which makes sense) but then in the regressions the skill does not look that good against what you would consider a baseline. I think the work here needs to be acknowledged, and it is clearly a hard problem. But I recommend publication a little bit more error analysis and in particular moving towards a prognostic error model would make this effort very useful to the community. **Can the authors please go into more details on what are the specific circumstances on when the algorithm works well versus when it doesn't?** Is it small clouds, or deeper layers, etc? This would be appreciated. Best wishes.

We understand that the quantitative prognostic uncertainty using such methods as model simulations would help demonstrating the algorithm's skill. However, considering that our

algorithm is based on parallax estimation from image-matching, quantitative assessment of uncertainty is limited. In Sect. 4.2 we showed a quantitative uncertainty induced by INR error, which makes systematic error. As the reviewer mentioned, this does not give the community information of specific circumstances on when the algorithm works well versus when it doesn't. Therefore, we conducted a quantitative assessment of uncertainty of some cases that may induce retrieval uncertainty (surface feature, and multiple layers of aerosol). This is done by simulating retrieval by generating two images from each satellite, and manually moving one image to get a parallax value that aerosol layer would make in real situation. Please note that impacts of small clouds are not examined because the algorithm works only on cloud-free images.

As shown in Fig. AR1, dense aerosol that blocks surface signal results in retrieval of the aerosol top height. However, stereoscopic ATH retrieval of thin aerosol layer that permits surface signals to penetrate results in image-matching of the surface (retrieved height = 0 km). Fig. AR2 shows cases of multiple layers. Addition of a thin upper aerosol layer does not change the retrieval results, but as the upper layers thicken, higher ATH (closer to the upper layer) is retrieved. Detailed discussions are in manuscript Sect 4.2.

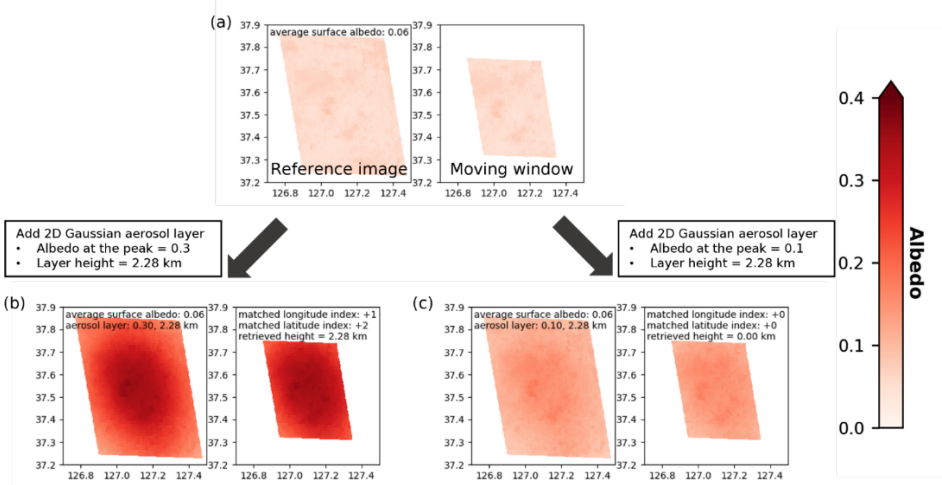

Figure AR1 A graphical illustration of stereoscopic ATH retrievals. Over (a) a surface with average albedo of 0.06, 2-dimensional Gaussian-shaped aerosol layers at 2.28 km with peak albedo of (b) 0.30 and (c) 0.10 are added.

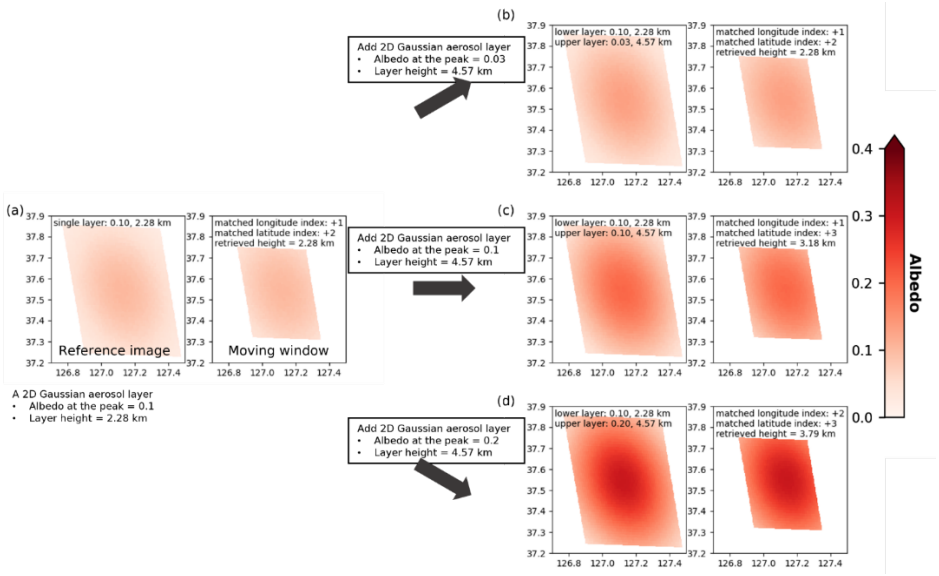

Figure AR2 Same as Fig. AR1, but assuming a dark surface. Over (a) a single layer of aerosol with peak albedo of 0.10 at 2.28 km, three different upper aerosol layers at 4.57 km with peak albedo of (b) 0.03, (c) 0.10, and (d) 0.20 are added.