



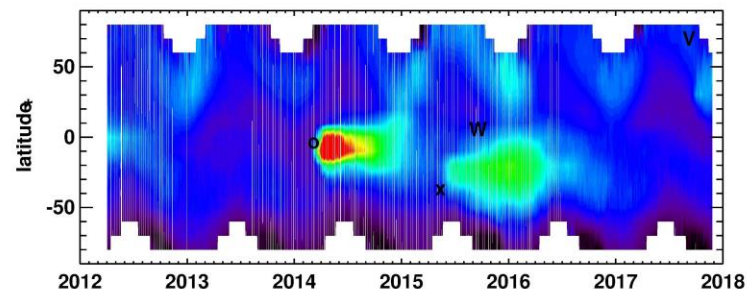
# Comparison of OMPS LP aerosol profiles with SAGE III/ISS



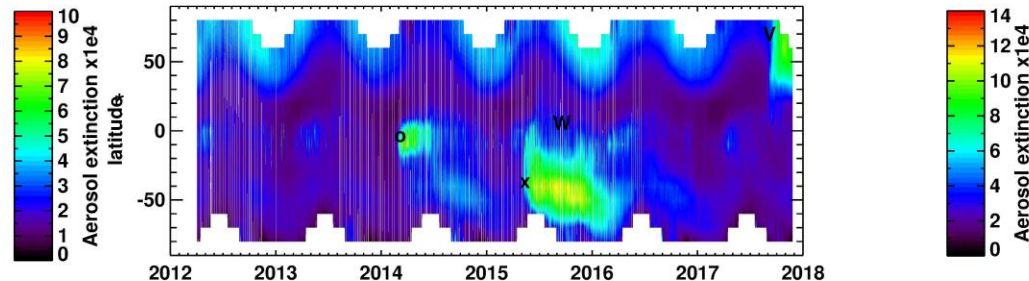
**Ghassan Taha<sup>1,2</sup>, P.K. Bhartia<sup>2</sup>, Zhong Chen<sup>3</sup>, and Glen Jaross<sup>2</sup>**

*<sup>1</sup>Universities Space Research Association, <sup>2</sup>NASA GSFC, <sup>3</sup>SSAI*

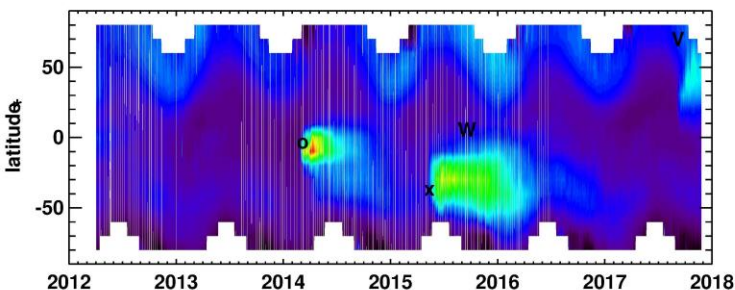
aerosol ext 20 km



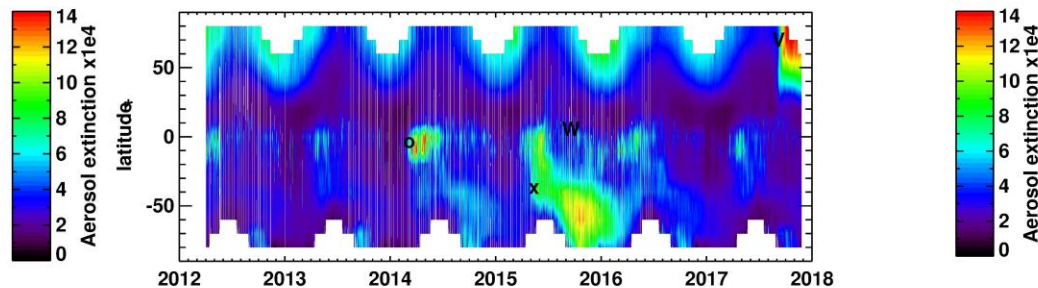
aerosol ext 16 km



aerosol ext 18 km



aerosol ext 14 km



\* Nabro      o Kelut      x Calbuco      V BC fires  
W Cotopaxi



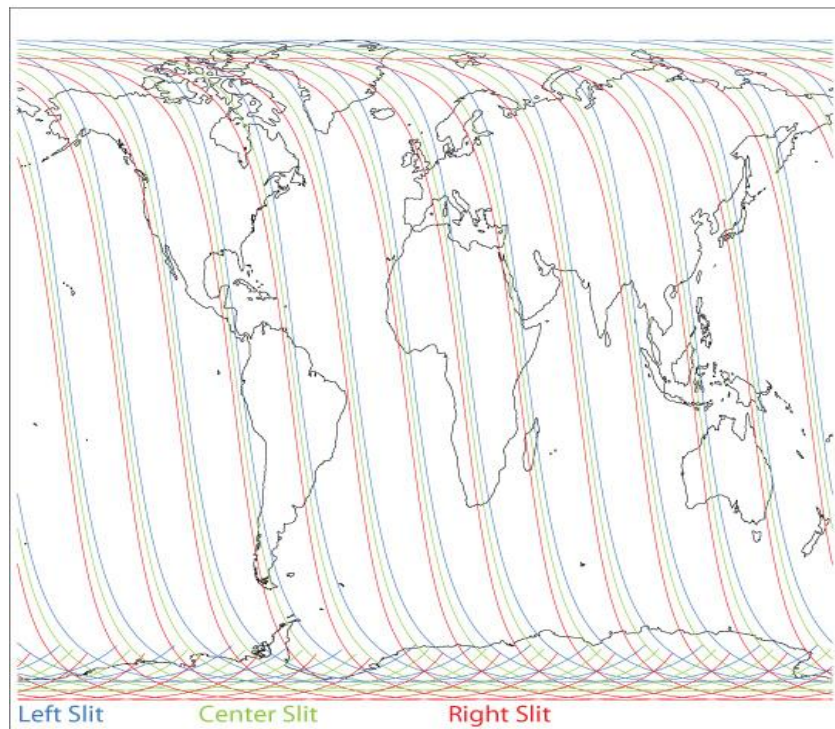
## Outline

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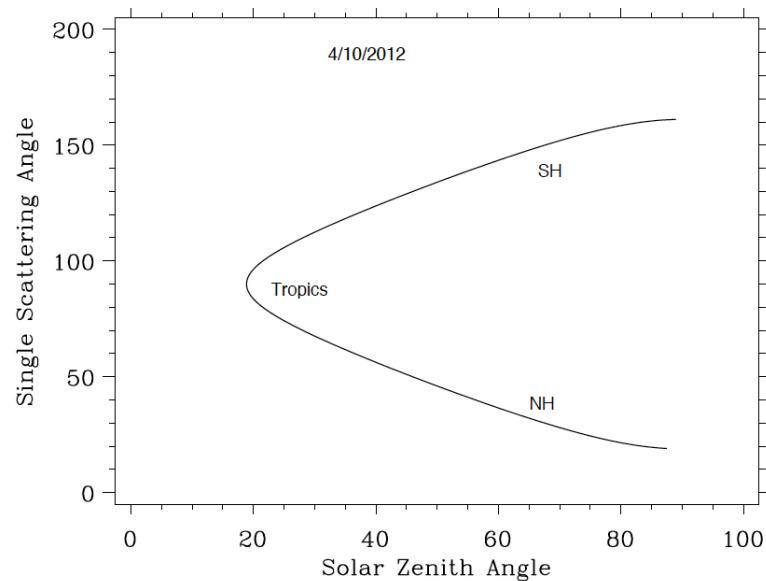
- OMPS aerosol retrieval V1.0 and V1.2 differences
- Comparison between ascending and descending aerosol climatology to characterize aerosol model uncertainties
  - Version 1.0 & V1.2
- OMPS LP vs. SAGE III/ISS comparison
  - Version 1.0 & V1.2
- Summary



# OMPS LP daily coverage



Variation of OMPS LP SSA



3 slits, 14-15 orbits each day, 160 events, ~7200 measurement daily



## Version 1.0 and 1.2 differences

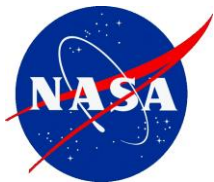
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### **Version 1.0** (Public release)

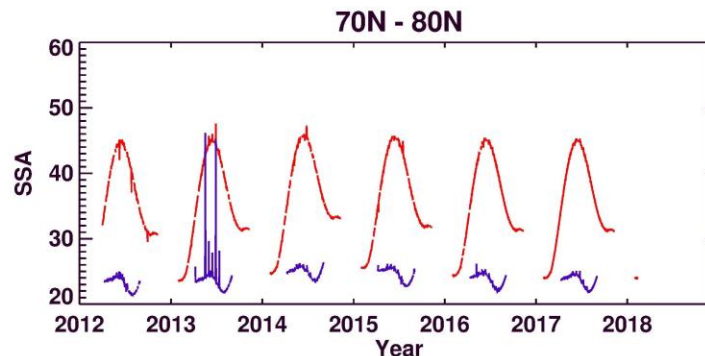
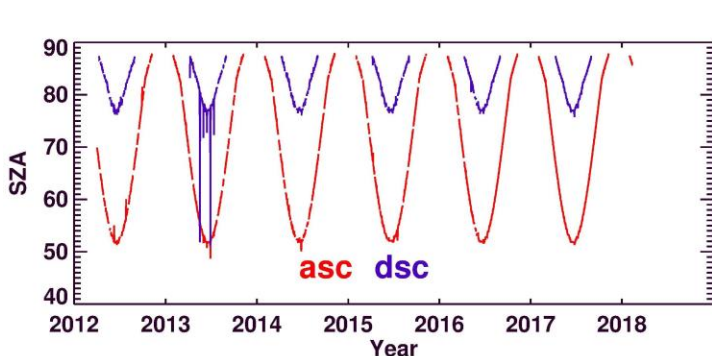
- Pueschel et al., (1994) bi-modal lognormal aerosol size distribution (ASD) with no altitude variations
- Known issues:
  - SH negative bias
  - Seasonal variation in NH correlated with Scattering Angle (SSA)
  - Underestimation of large aerosol plumes (volcanos, biomass burning, etc.)

### **Version 1.2** (candidate release)

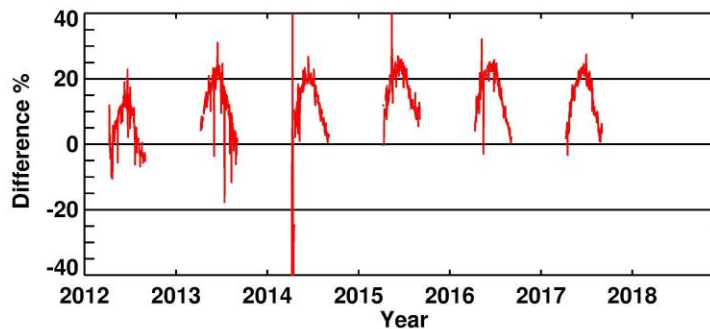
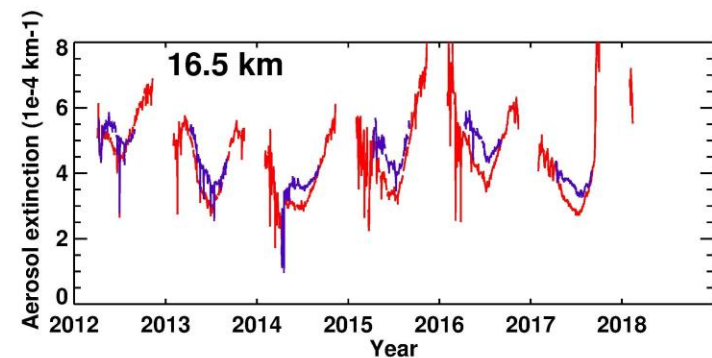
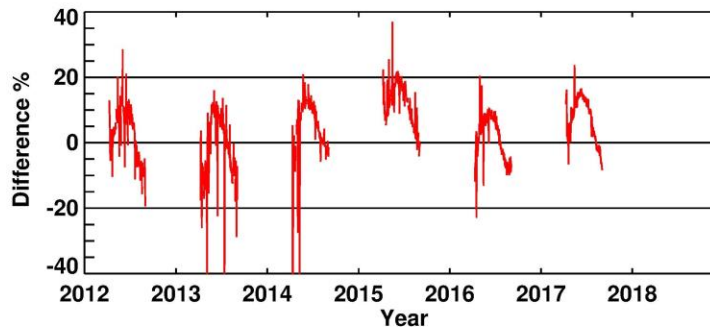
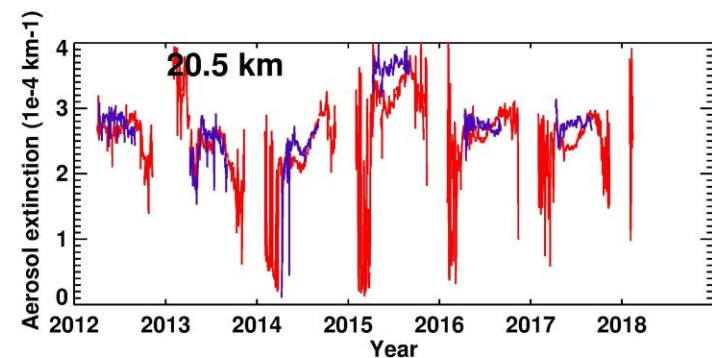
- CARMA model, gamma aerosol size distribution (ASD), with no altitude variation
- Allow extra iteration
- Only 2017 - 2018 is processed



# OMPS V1.0 Ascending vs. Descending differences 70 – 80 N



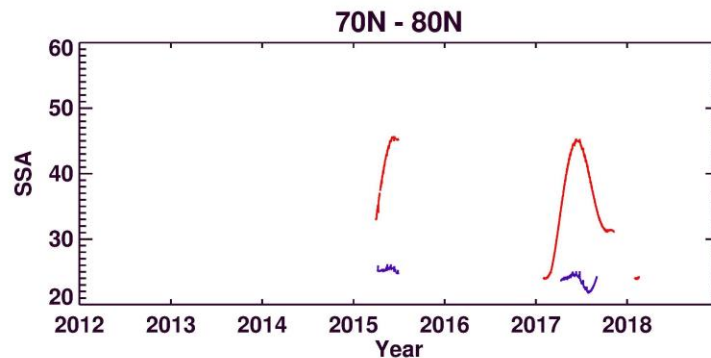
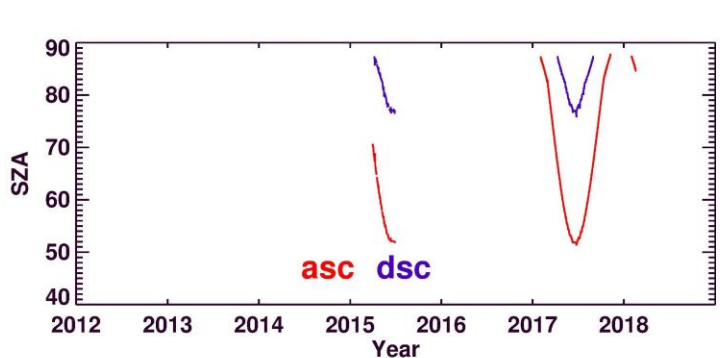
Ascending  
Descending



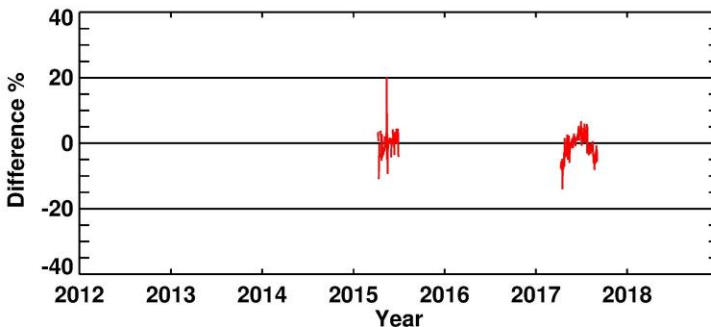
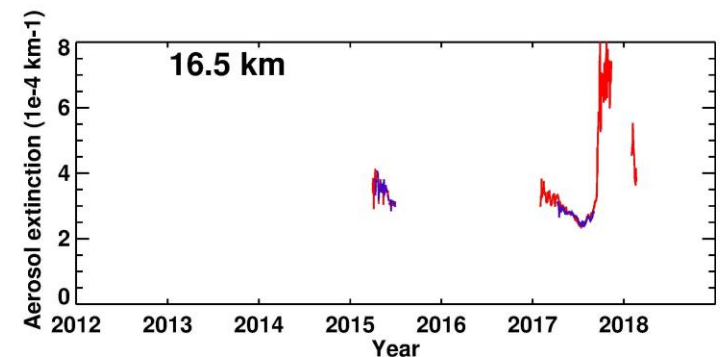
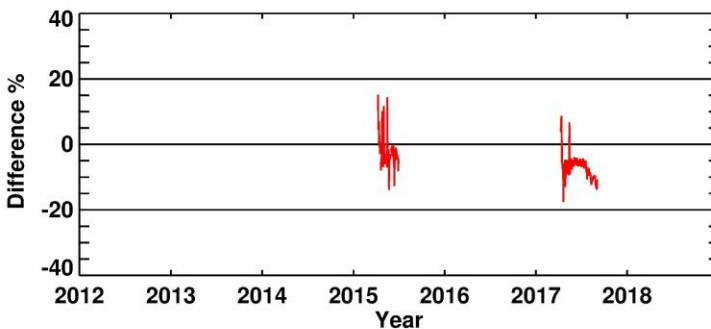
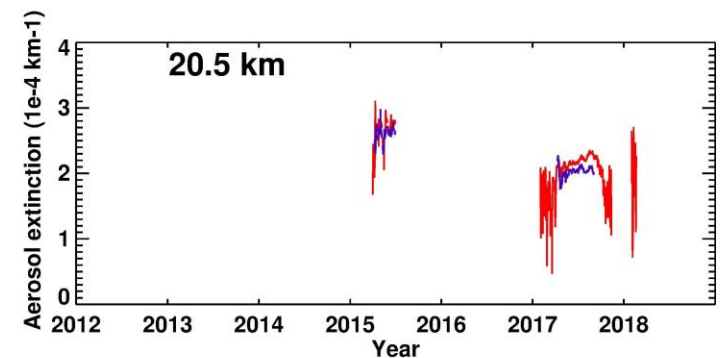




# OMPS V1.2 Ascending vs. Descending differences 70 – 80 N

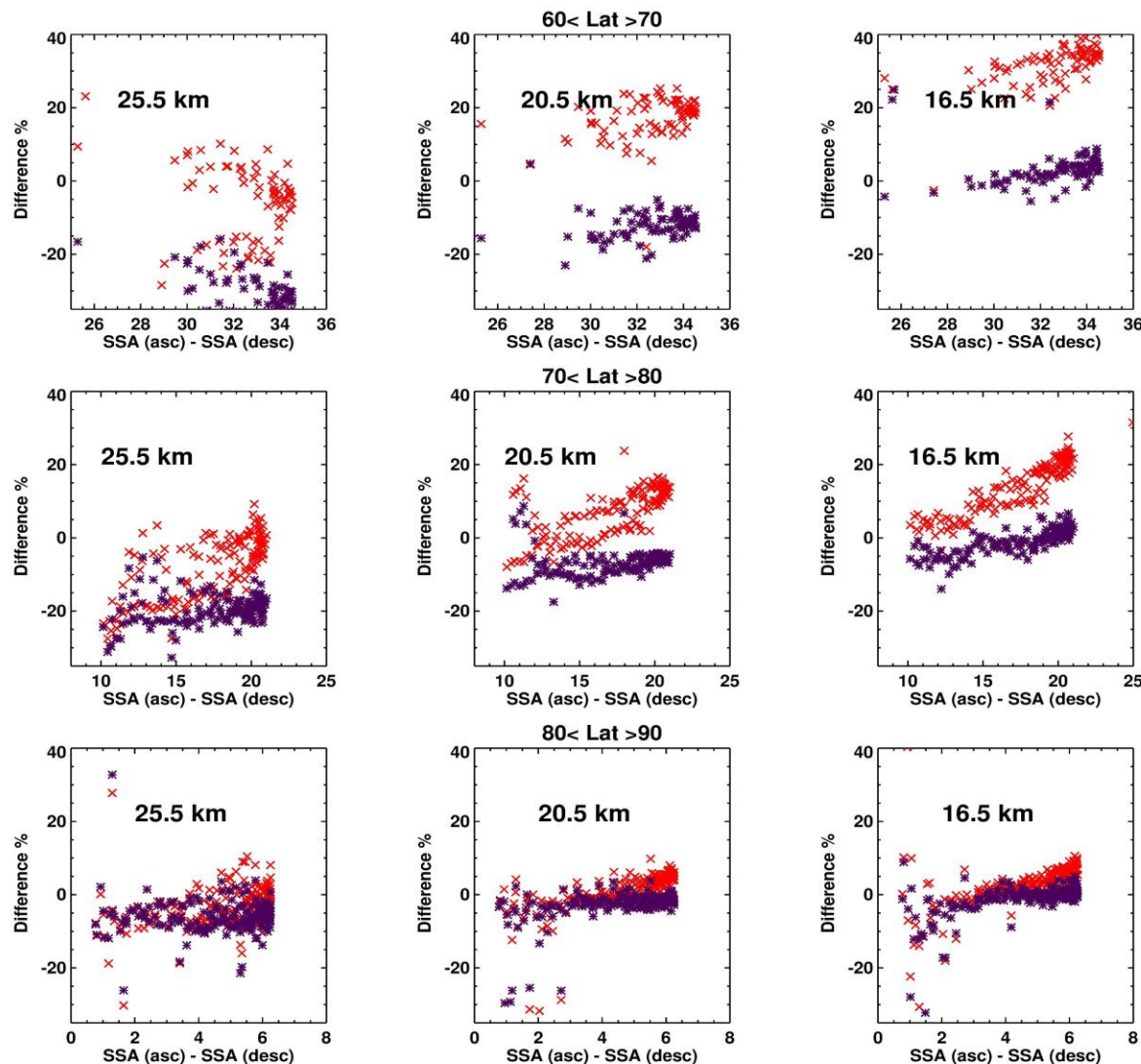


Ascending -  
Descending





# Ascending/Descending difference vs. scattering angle (NH)



**Version 1.0**  
**Version 1.2**

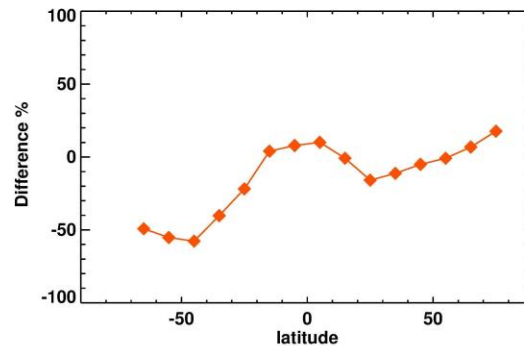
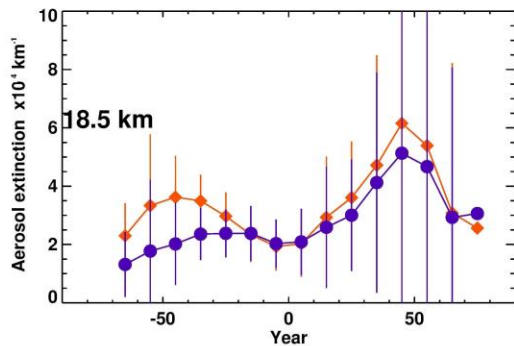
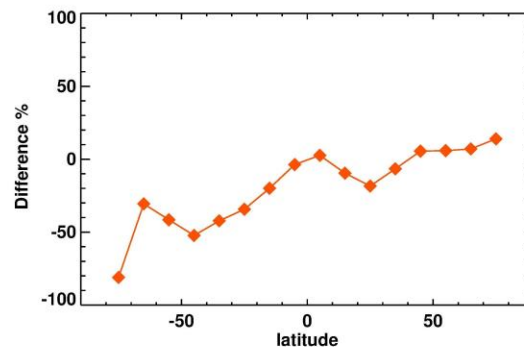
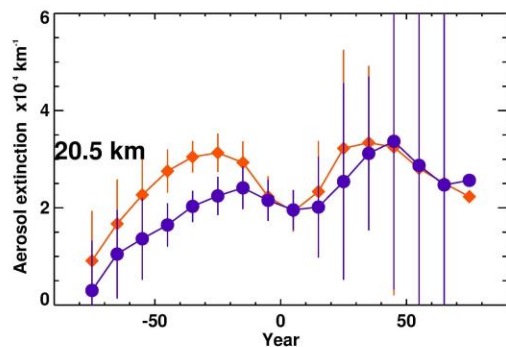
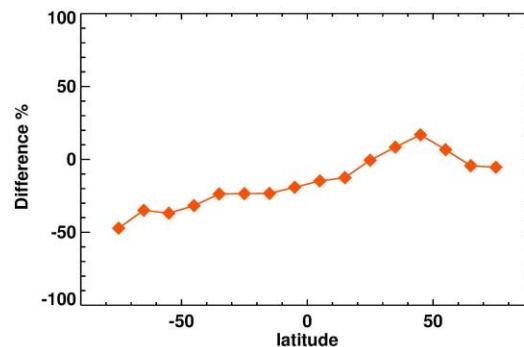
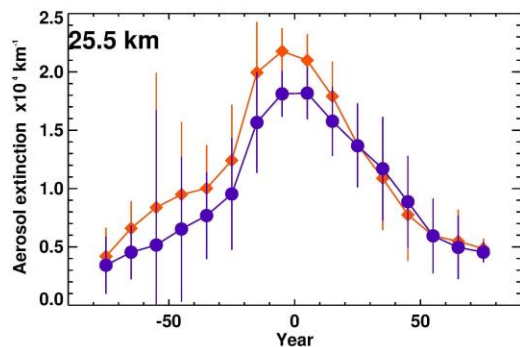
**60N - 70N**

**70N - 80N**

**80N - 90N**



# OMPS LP (V1.0) vs. SAGE III/ISS

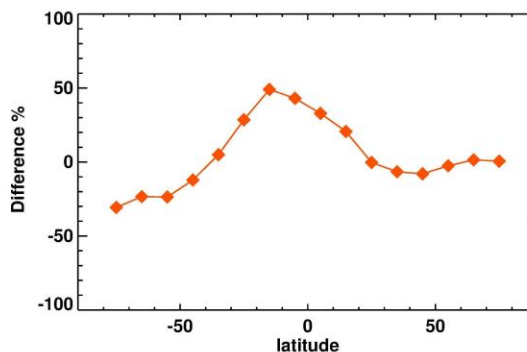
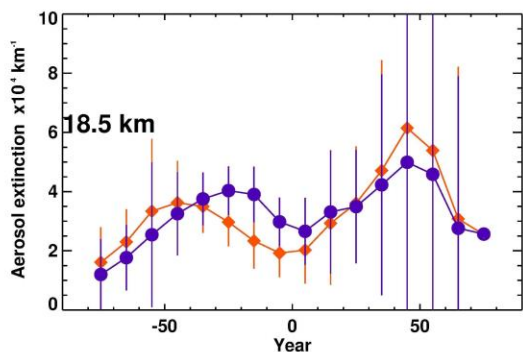
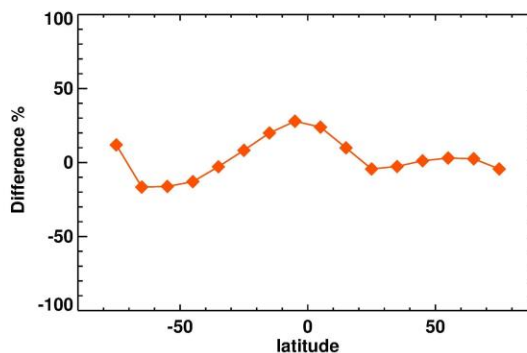
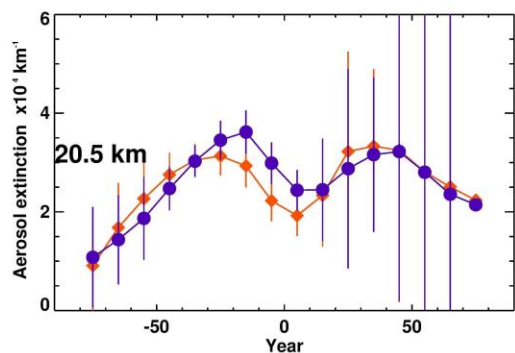
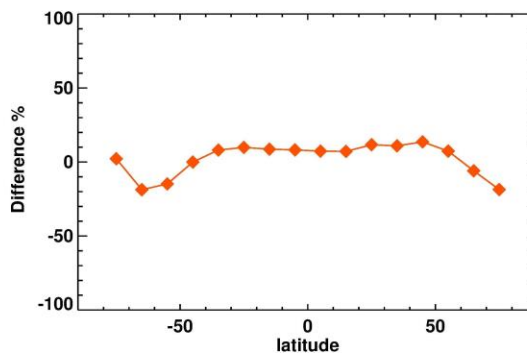
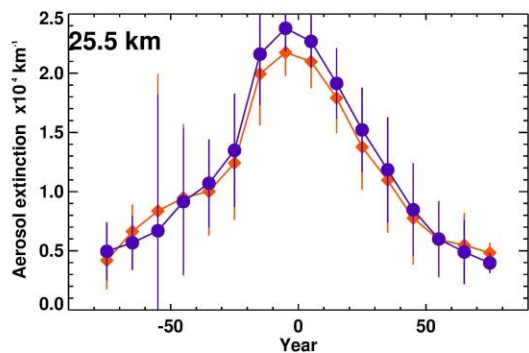


- June-Dec 2017
- Coincidence pairs averaged zonally
- Use **SAGE** 676 nm & **OMPS** 674 nm





# OMPS LP (V1.2) vs. SAGE III/ISS

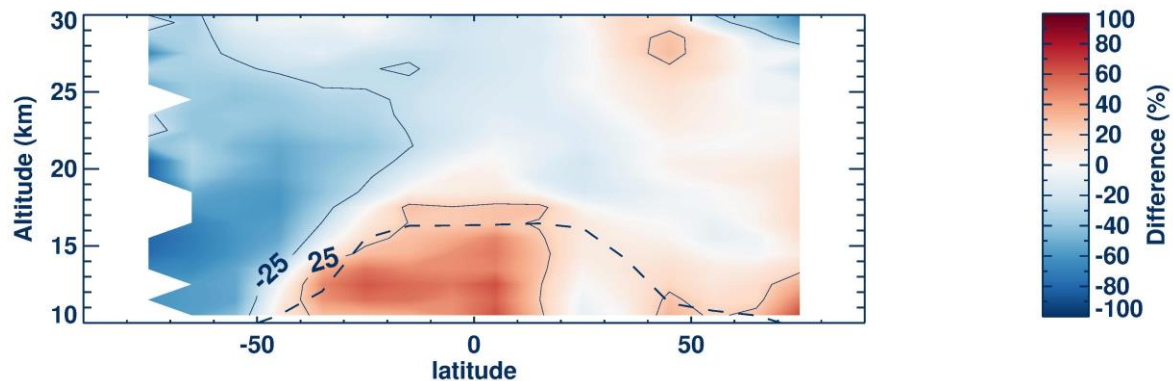




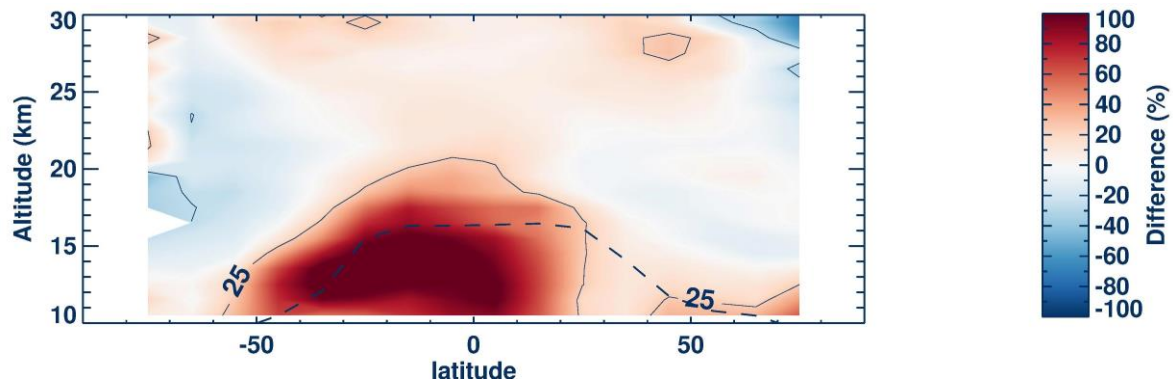
# OMPS LP vs. SAGE III/ISS Summary



## Version 1.0



## Version 1.2





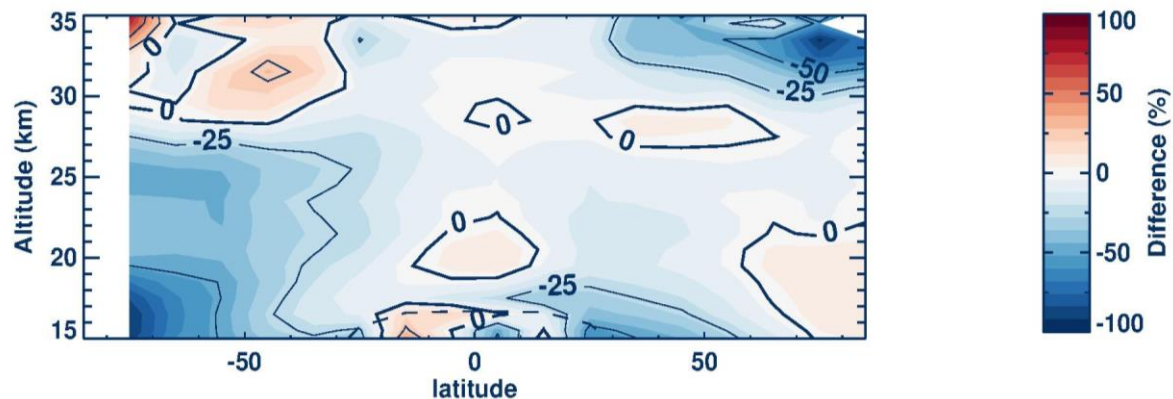
## Summary

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- **New aerosol model reduces assumed ASD errors**
  - **Bias in SH is reduced significantly**
  - **Seasonal variation in NH caused by viewing geometry is reduced significantly**
- **OMPS LP agrees well with SAGE III newly released data, mostly within 10%**
  - **SAGE III/ISS aerosol data looks good, very few issues**
  - **Geographical bias mostly eliminated in V1.2**
- **For the future, need ASD that vary by altitude, latitude, and time**
  - **Use SAGE III multi-wavelengths measurements to estimate Angstrom exponent**
  - **Add longer wavelengths retrieval**



## OMPS V1.0 vs. OSIRIS



## OMPS V1.0 vs. CALIPSO

