CERES Aerosol Datasets - Terra MODIS, Aqua MODIS, and NPP VIIRS MODIS-Like AOD Assimilation

David Fillmore

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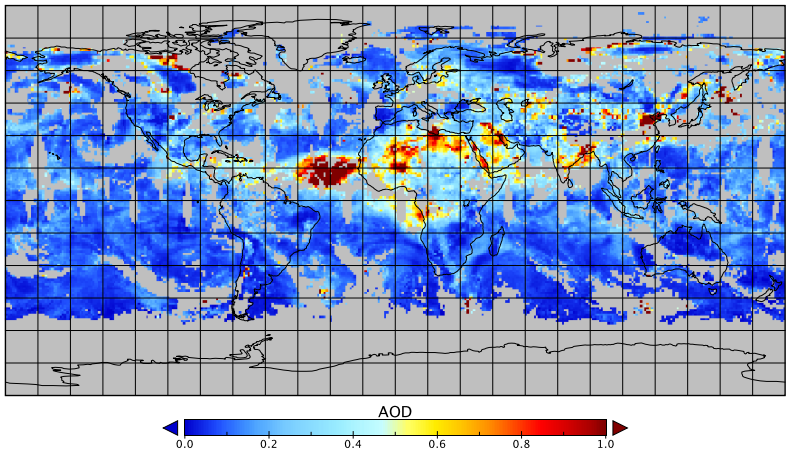
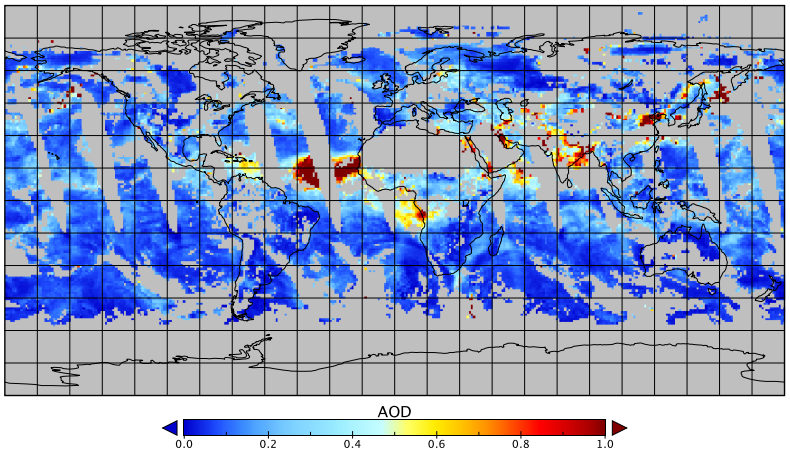
MODIS to VIIRS Transition and Aerosol Optical Depth Assimilation

- MATCH AOD assimilation generates hourly 3D aerosol fields for SARB radiative transfer model
- CERES Edition 4 MATCH uses Terra and Aqua MODIS 5.1 Ocean, Dark Target merged with Deep Blue
- Today look at Terra and Aqua MODIS 6, versus NPP VIIRS MODIS-Like AOD assimilation
- Use CERES Edition 4 MATCH

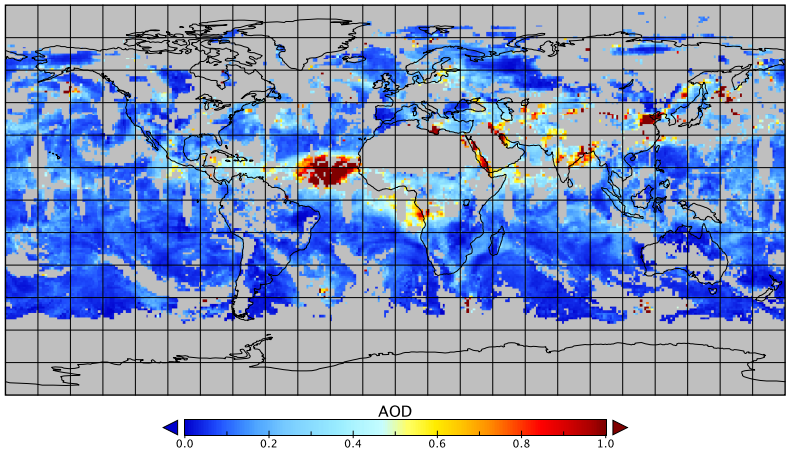
Terra and Aqua MODIS with DeepBlue C6 AOD 2013 06 01



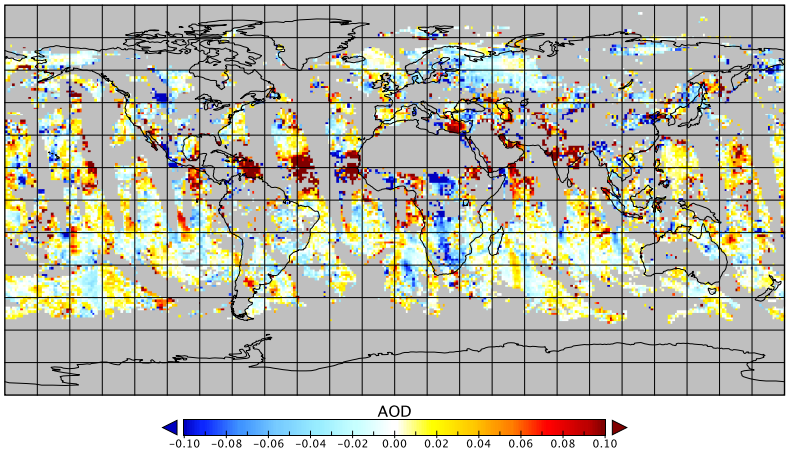
NPP VIIRS AOD 2013 06 01



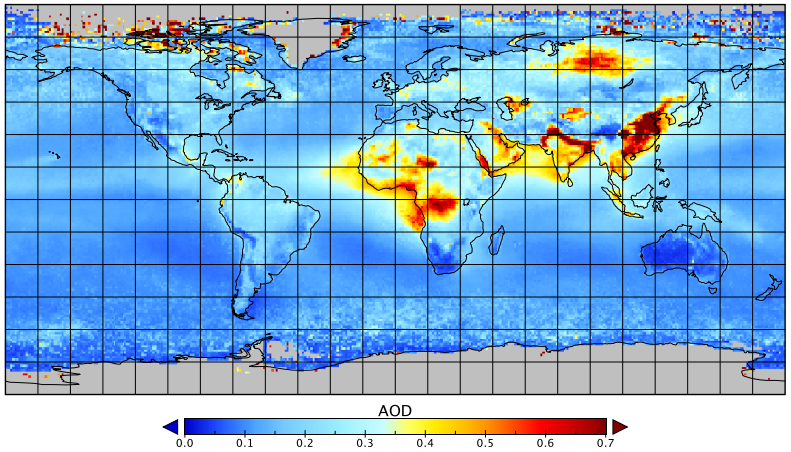
Terra and Aqua MODIS C6 AOD 2013 06 01



NPP VIIRS – Terra and Aqua MODIS C6 AOD 2013 06 01



Terra and Aqua MODIS with DeepBlue C6 AOD 2013



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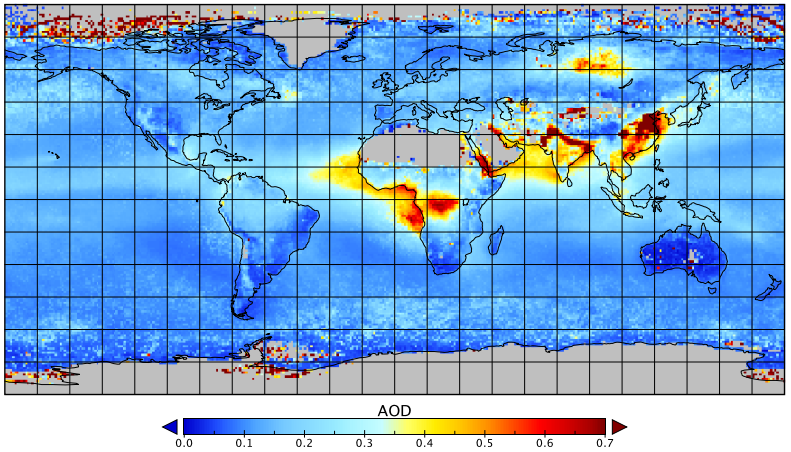
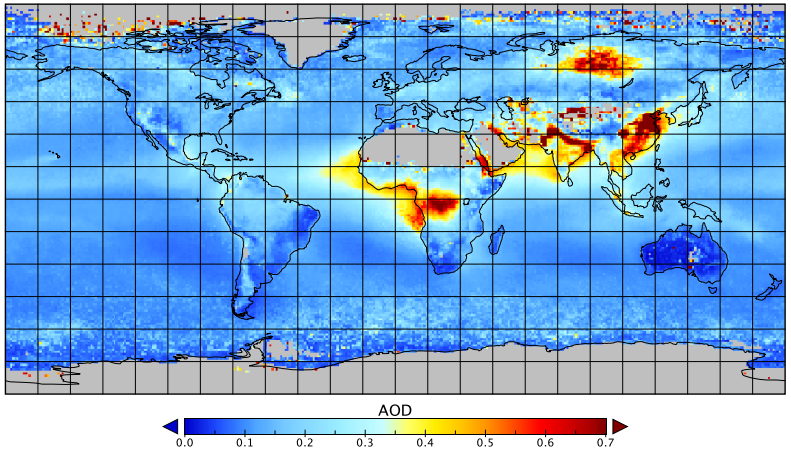
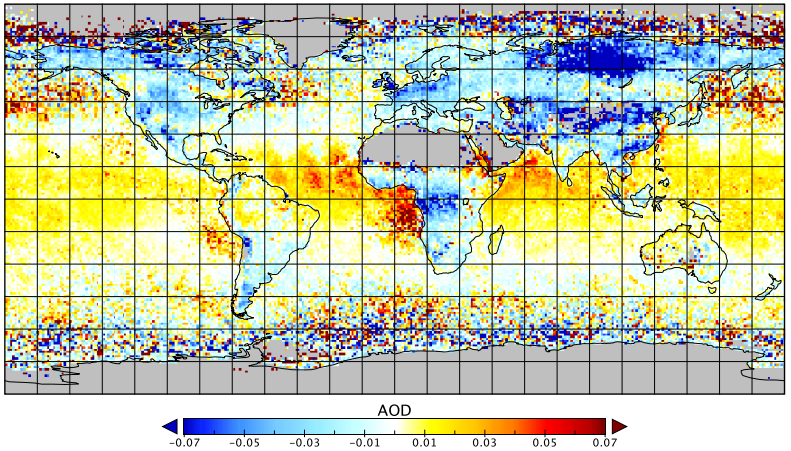


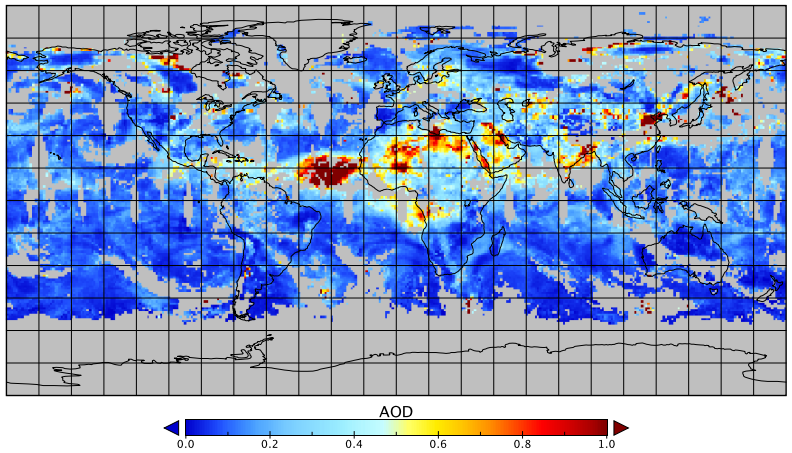
Terra and Aqua MODIS C6 AOD 2013



NPP VIIRS – Terra and Aqua MODIS C6 AOD 2013



Terra and Aqua MODIS with DeepBlue C6 AOD 2013 06 01



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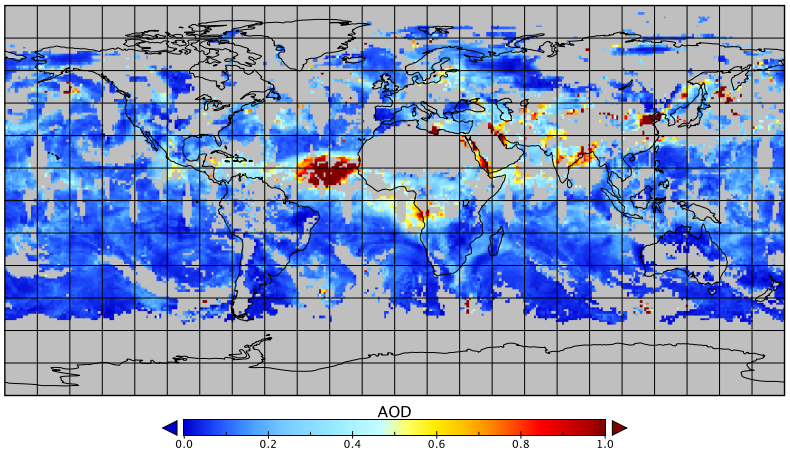
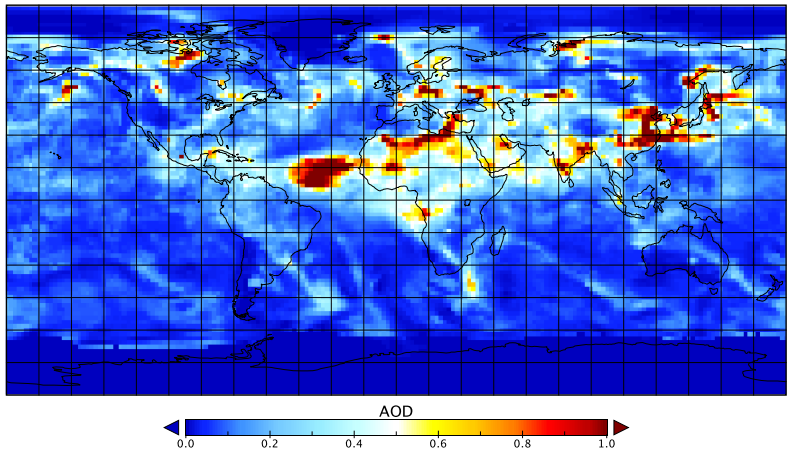
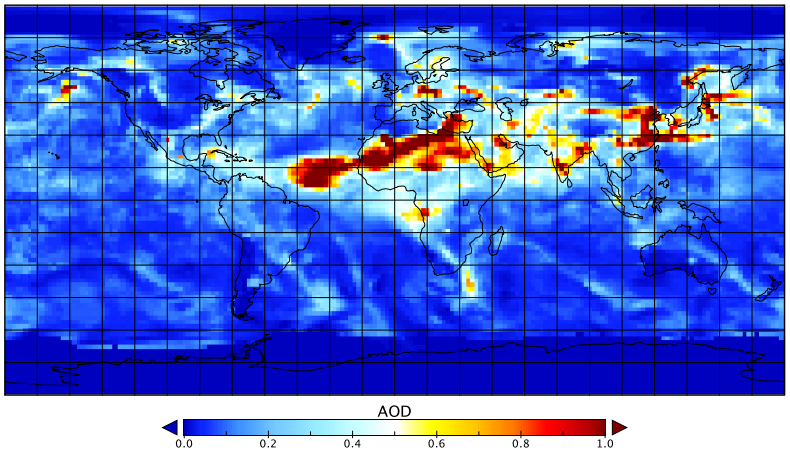


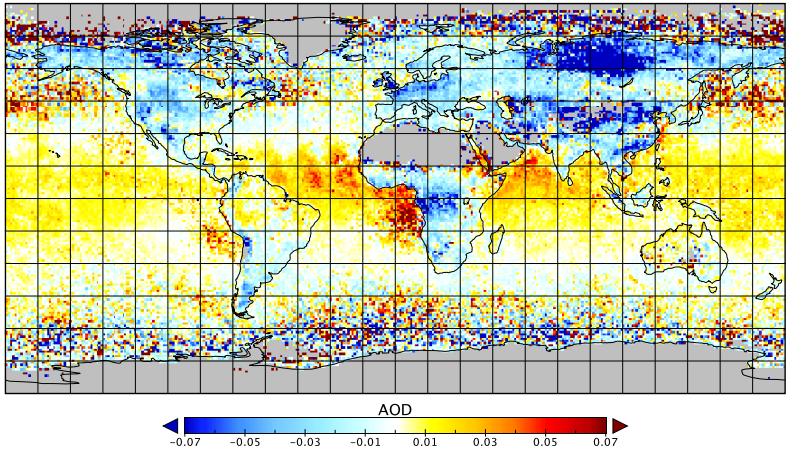
Assim Terra and Aqua MODIS with DeepBlue C6 AOD 2013 06 01



Assim Terra and Aqua MODIS C6 AOD 2013 06 01



NPP VIIRS – Terra and Aqua MODIS C6 AOD 2013



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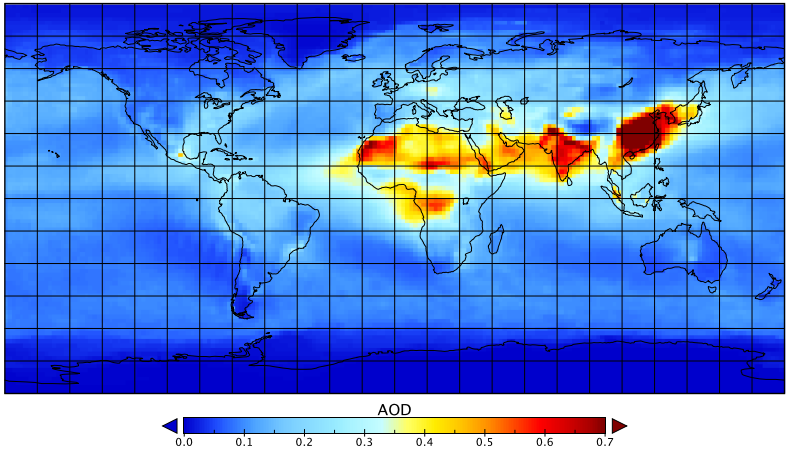
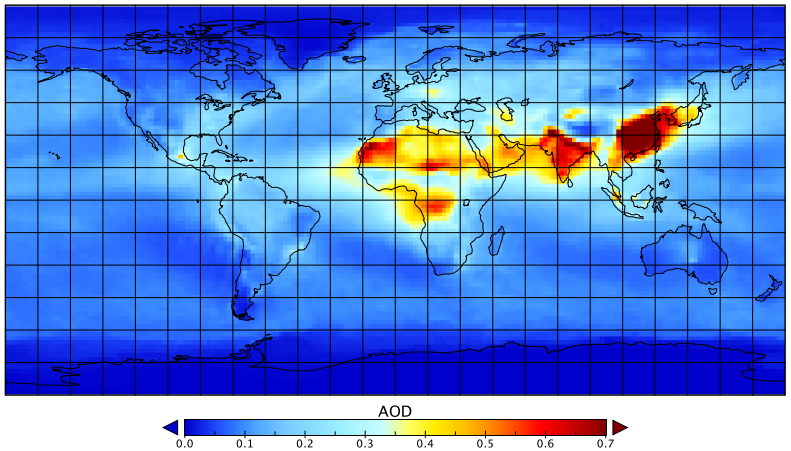
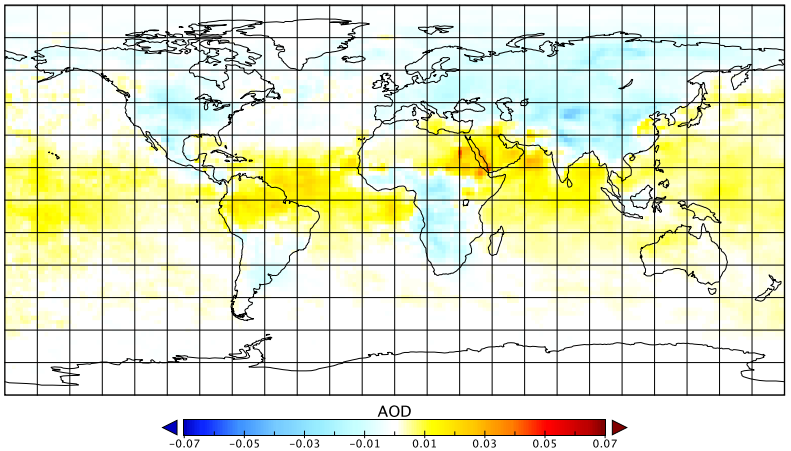


Assim Terra and Aqua MODIS C6 AOD 2013



Assim NPP VIIRS – Assim Terra and Aqua MODIS C6 AOD 2013

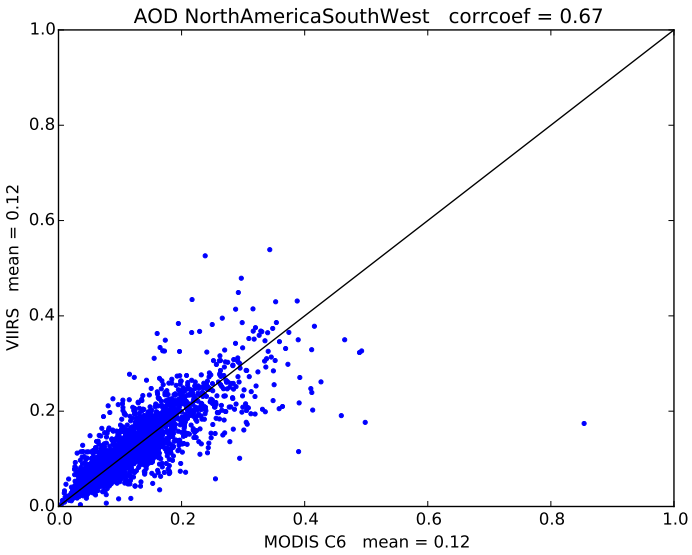


VIIRS v MODIS

Assim MODIS v MODIS

Assim VIIRS v Assim MODIS

Assim VIIRS v VIIRS


AOD NorthAmericaSouthWest corrcoef = 0.67
VIIRS mean = 0.12
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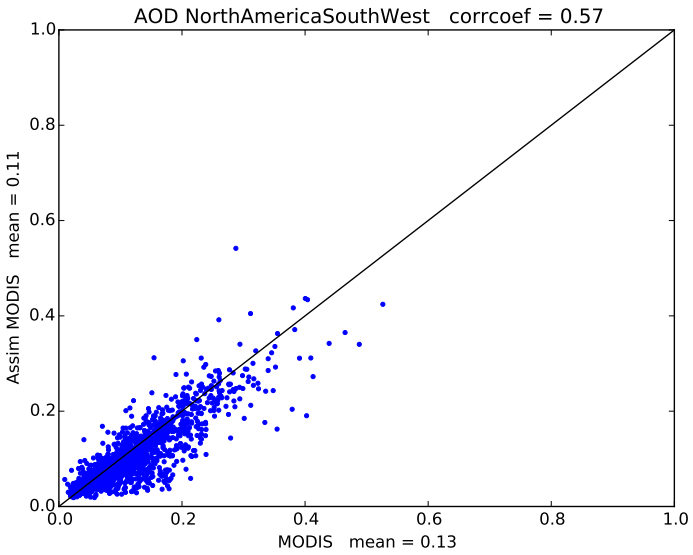
0.2
0.4
0.6
0.8
1.0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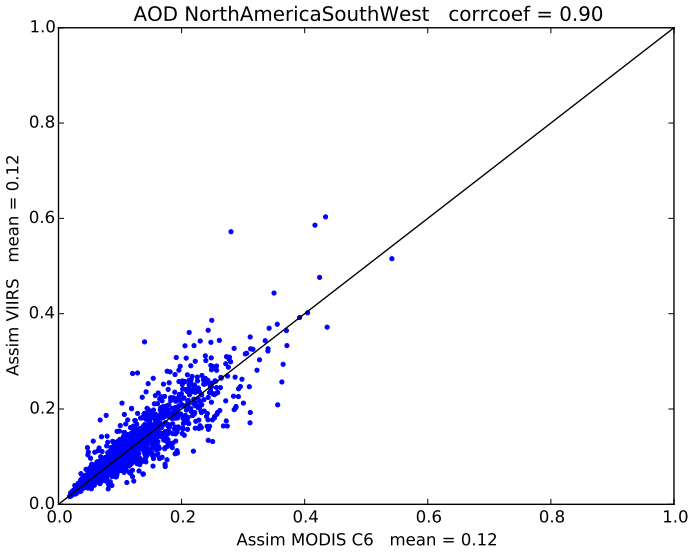
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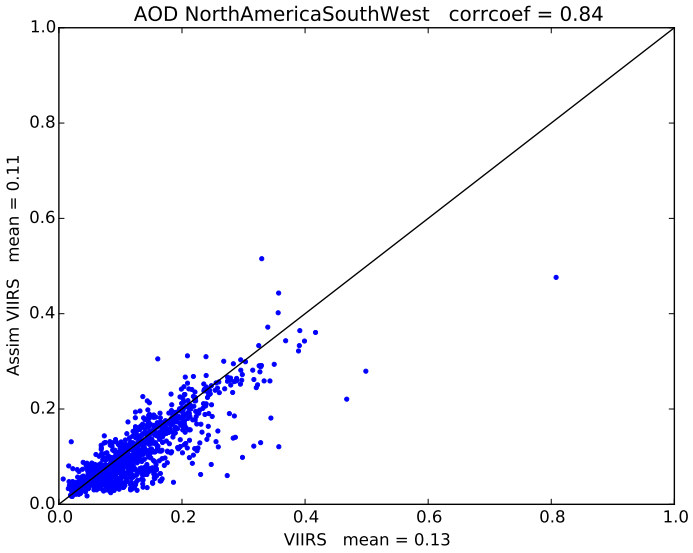
1.0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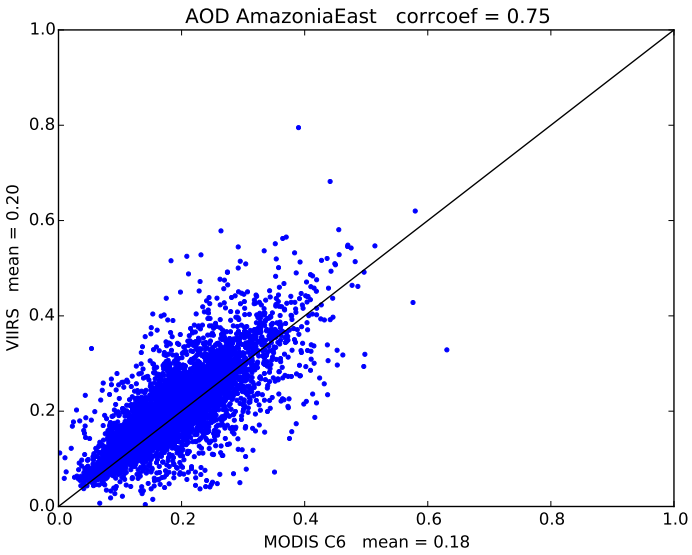
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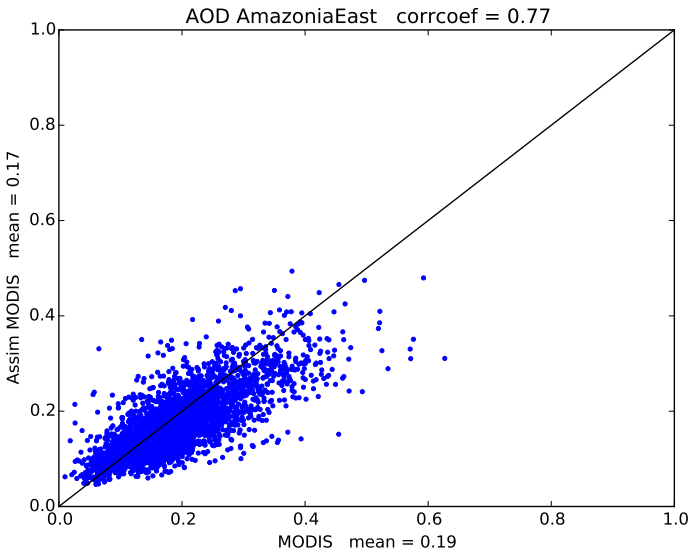
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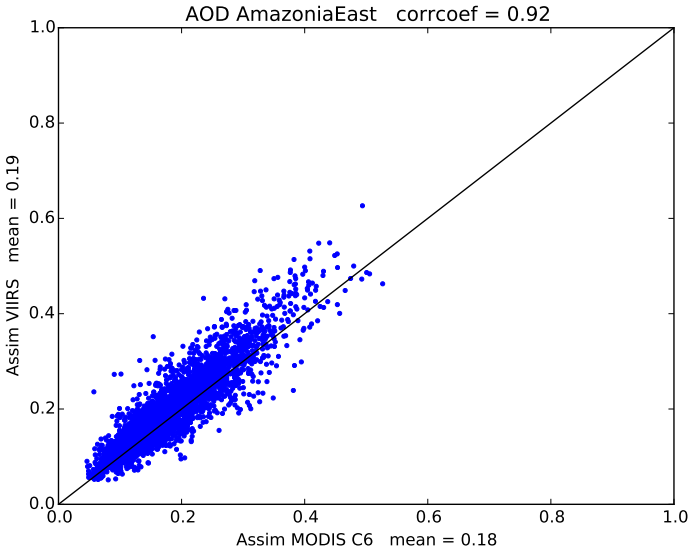
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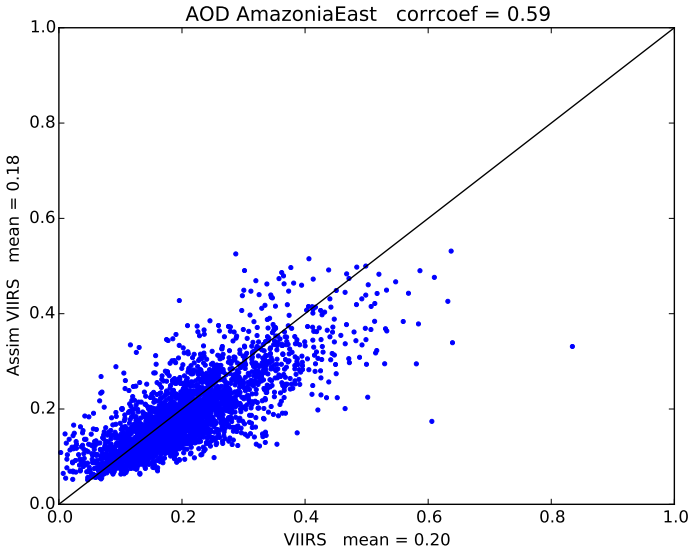
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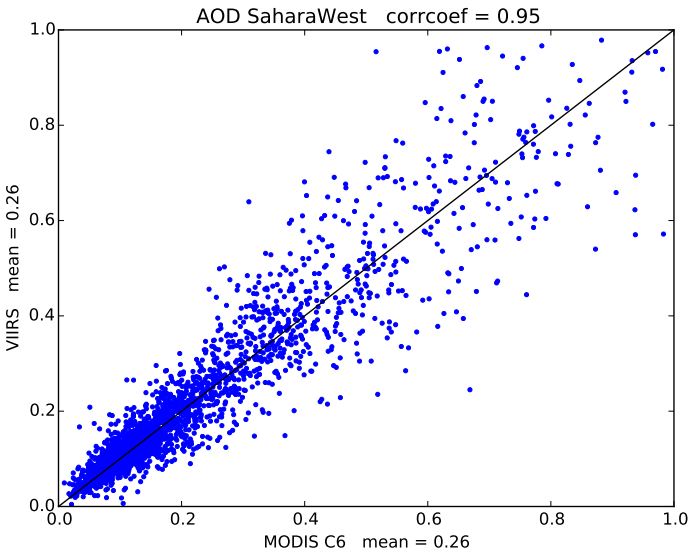
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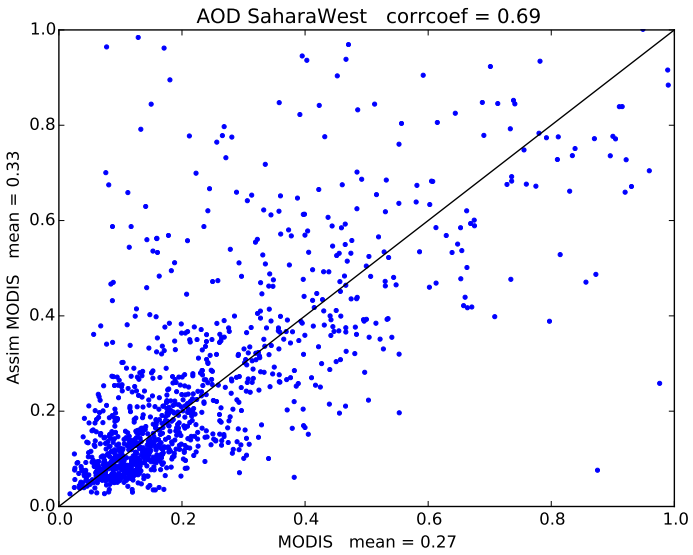
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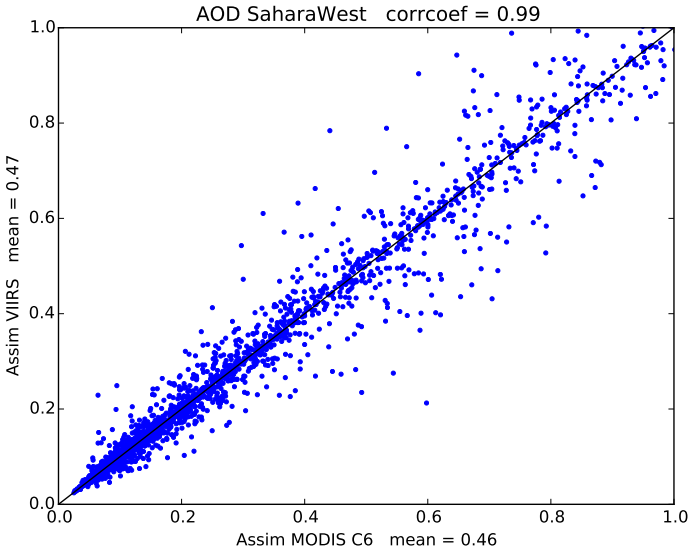
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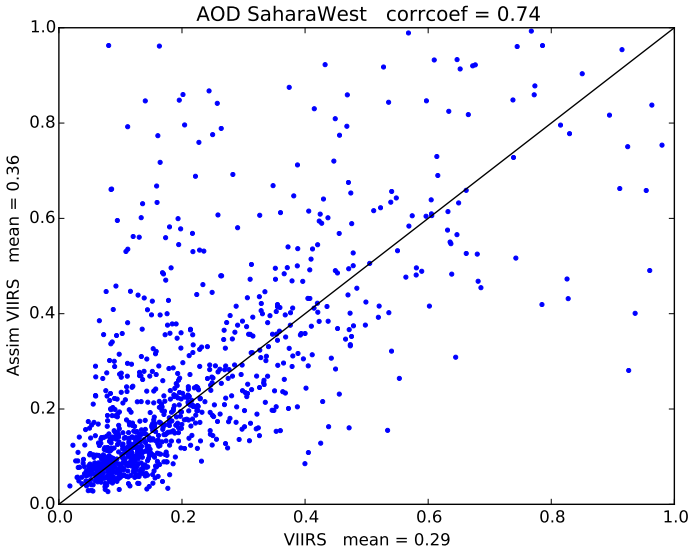
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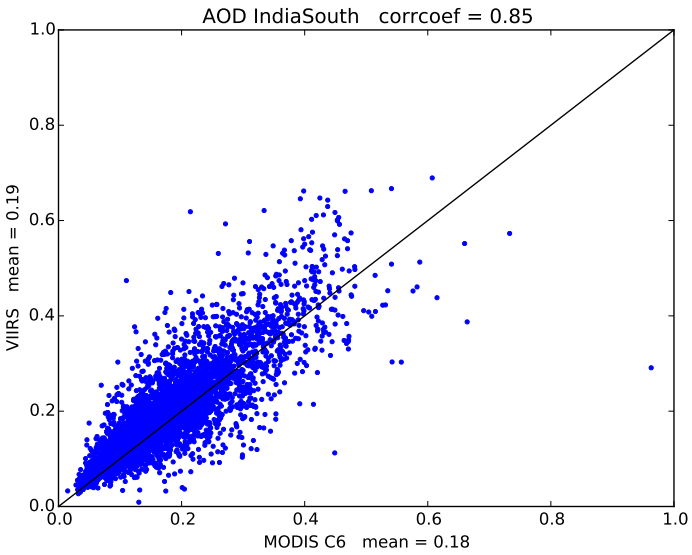
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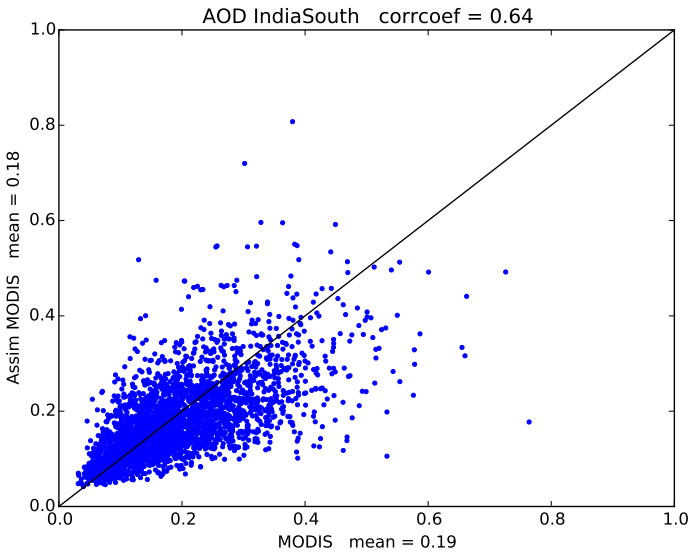
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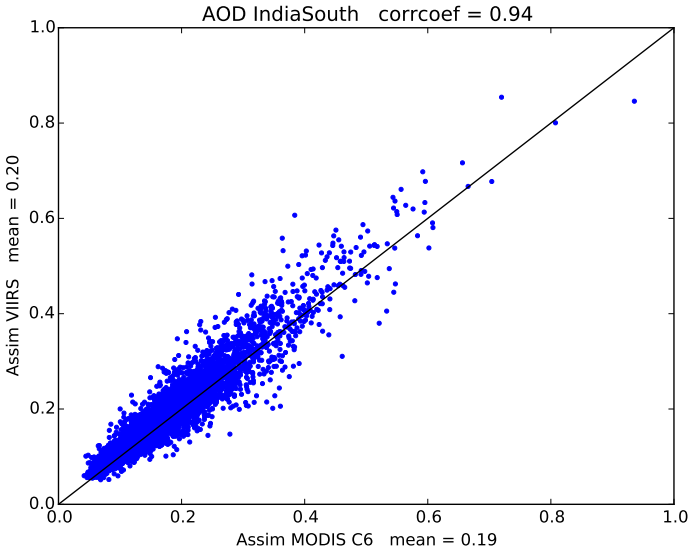
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Assim MODIS C6 mean = 0.19
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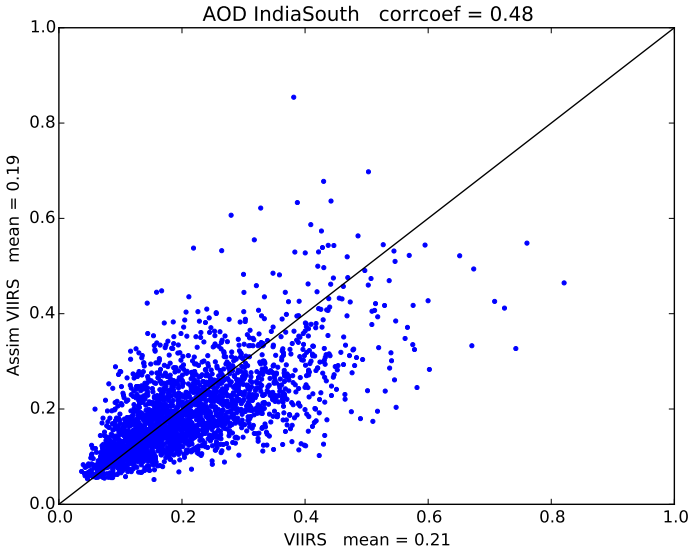
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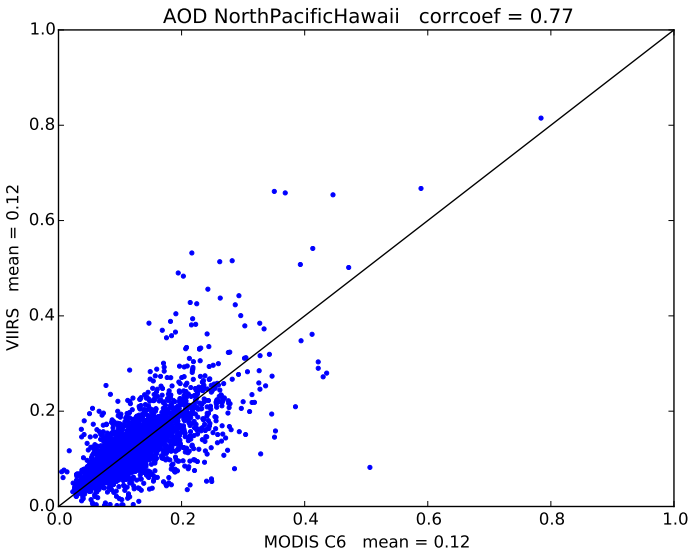
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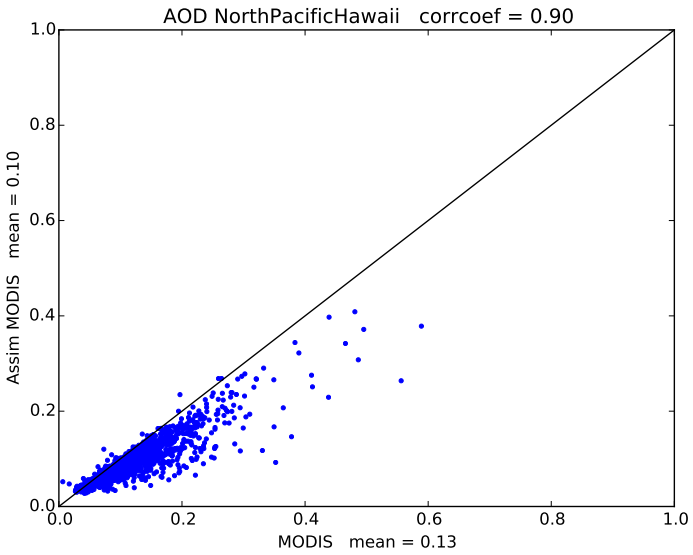
AOD NorthPacificHawaii corrcoef = 0.90
Assim MODIS mean = 0.10
MODIS mean = 0.13
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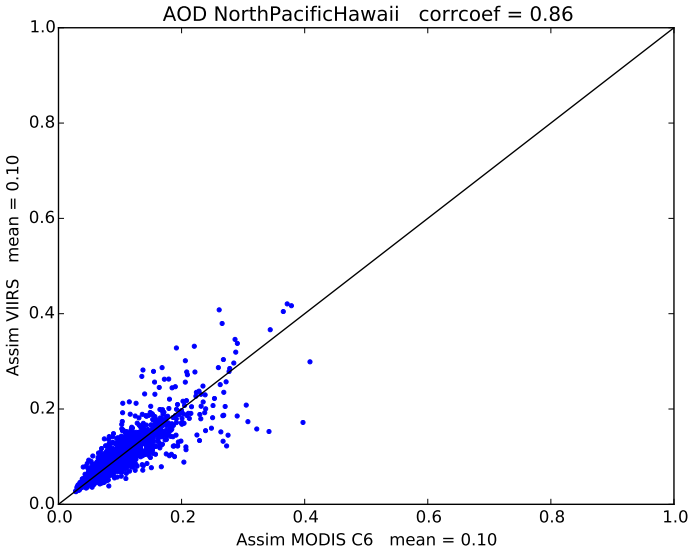
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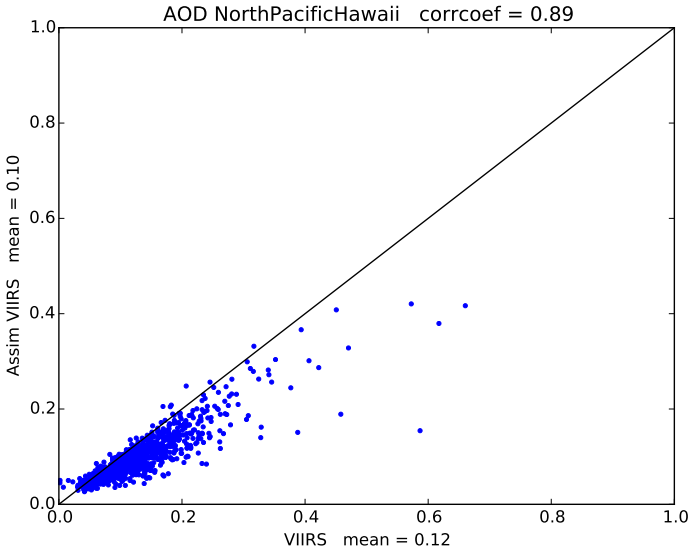
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Assim VIIRS mean = 0.10
VIIRS mean = 0.12
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0.2
0.4
0.6
0.8
1.0

Conclusions

- First pass at NPP VIIRS MODIS-Like AOD assimilation
- Assimilation in general reduces the bias between VIIRS and MODIS and improves correlation
- Potential improvements

Next

- want MODIS v Assim MODIS correlation high
- want VIIRS v Assim VIIRS correlation high
- *also* want Assim MODIS v Assim VIIRS correlation high
- Reformulate assimilation (cost function)
- Assimilation of merged VIIRS, MODIS (Deep Blue)?