

Direct comparison of VIIRS mini-IDPS v0.48 to MODIS C005 Cloud properties

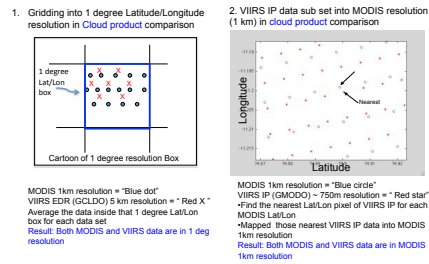
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Atmosphere PEATE

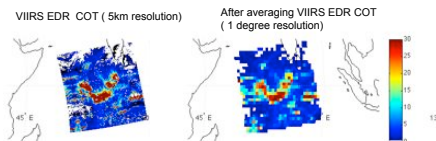
Introduction

- This work aims to evaluate the 2 orbits VIIRS mini-IDPS v0.48 Cloud products to MODIS C005 cloud products.
- To evaluate the VIIRS retrievals, both the pixel level (IP) ~ 750m resolution and aggregated products (EDR) 5km resolution need to be investigated.
- VIIRS and MODIS products are generated at different resolutions (VIIRS IP, VIIRS EDR, MODIS cloud product 1km and 10km resolution)
- Therefore we re-grid both the VIIRS and MODIS products and compare in fixed resolution

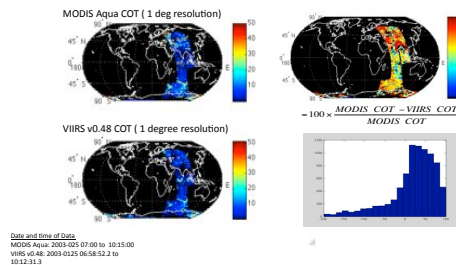
Gridding Methodology



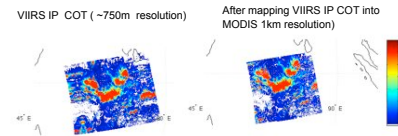
1 degree grid resolution of VIIRS COT (Example)



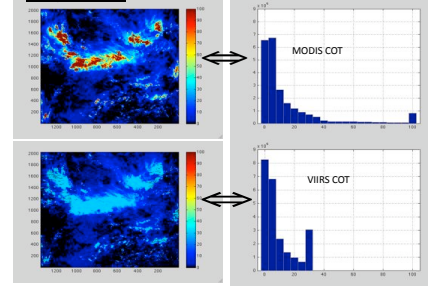
Comparison of MODIS-VIIRS COT and their percentage difference (1 deg)



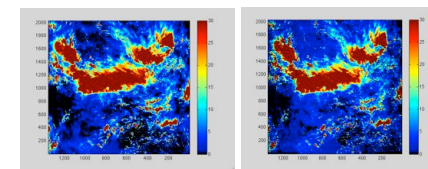
VIIRS ERD data mapped into MODIS resolution



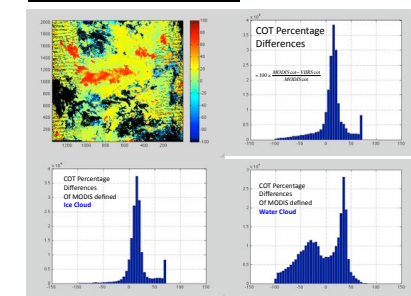
Direct comparison of MODIS COT Vs VIIRS COT (1 granule)



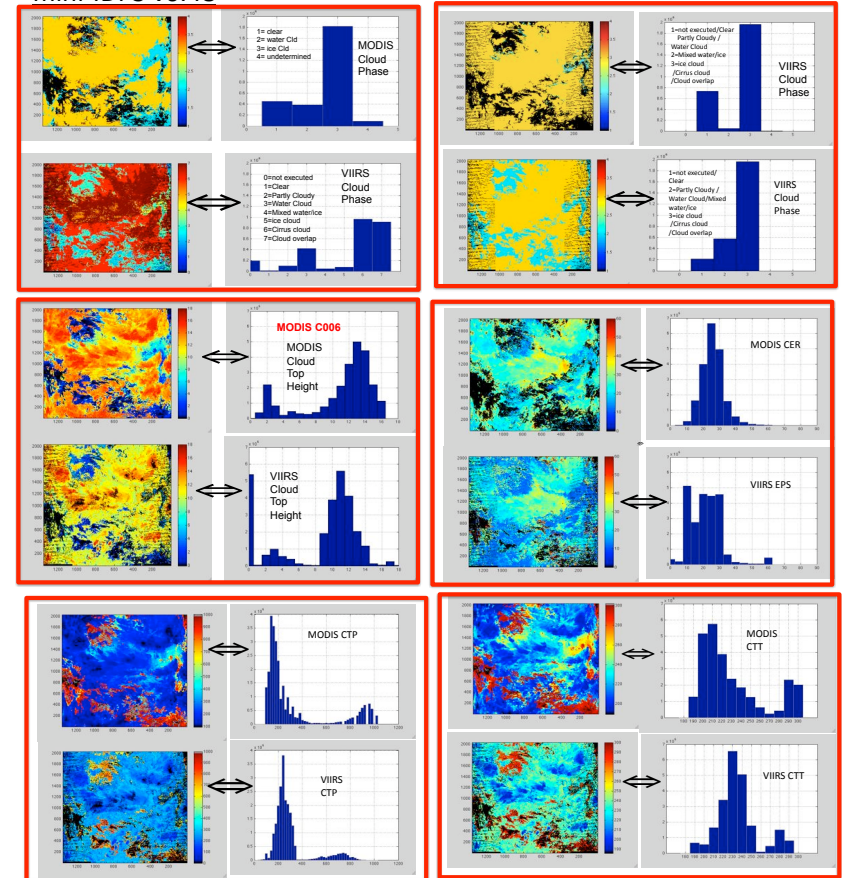
MODIS COT (limit to 30) Vs VIIRS COT



Percentage difference of MODIS-VIIRS COT in (1km MODIS resolution)



Quantitative comparison of MODIS C005 cloud product with VIIRS mini-IDPS v0.48



Conclusion

- Quantitative analysis shows that MODIS COT is higher than VIIRS COT since VIIRS COT is limited to ~ 30
- Percentage difference of COT in MODIS and VIIRS comparison show significant +ive and -ive biases in water clouds due to Henyey-Greenstein phase function to build look-up tables for water clouds
- MODIS High Cloud are higher than VIIRS High Cloud and MODIS Low Cloud are lower than VIIRS Low Cloud according to CTH, CTP and CTT comparison.
- Analysis of MODIS and VIIRS Cloud phase are not easy, since MODIS C005 present simple cloud phase (clear, water cloud, ice cloud and undetermined) while VIIRS retrieve more advance and details diversity of cloud phase.