

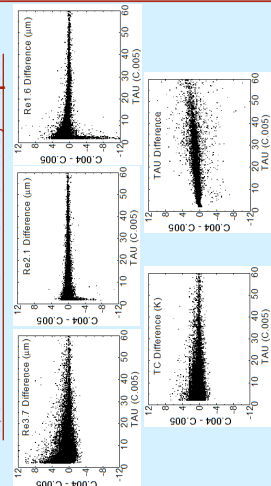
Retrievals and Comparisons of Various MODIS-Spectrum Inferred Water Cloud Droplet Effective Radii

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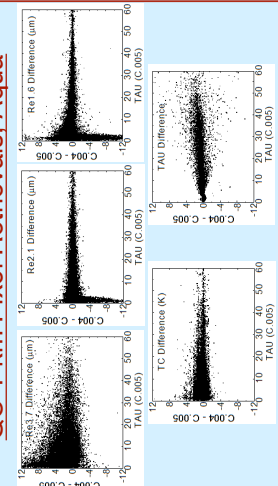
- How different are the retrievals of water-cloud droplet effective radii from different MODIS 2.1- μm , 3.7- μm , and 1.6- μm channels?
- π How would applying different retrieval algorithms affect the MODIS retrievals of droplet effective radii?
- π What are the differences between Collection 004 and Collection 005 in the MODIS MOD06 droplet effective radius retrievals?

Collection.004 versus Collection.005:
 Any impact resulted from changing cloud top temperature (Tc) retrievals? C.004 uses 5-km mean radiance, while C.005 uses 5-km mean cloudy-pixel radiance, for Tc retrievals.

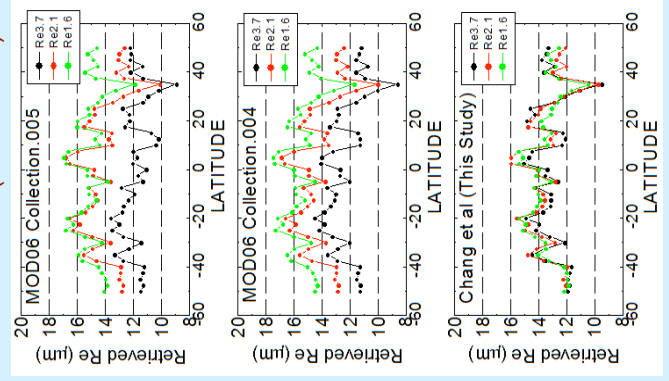
Comparisons from The Most Confident QC 1-km Pixel Retrievals, Aqua



Comparisons from The Less Confident QC 1-km Pixel Retrievals, Aqua



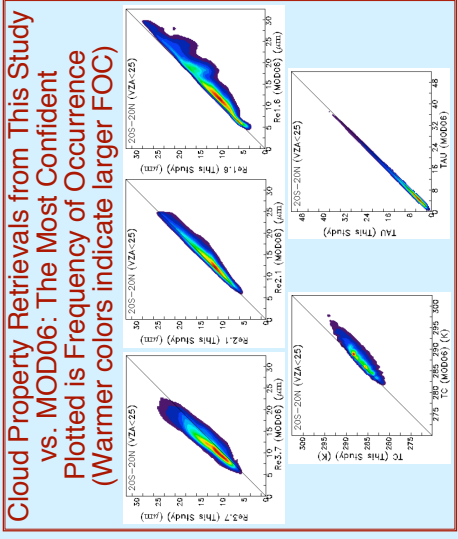
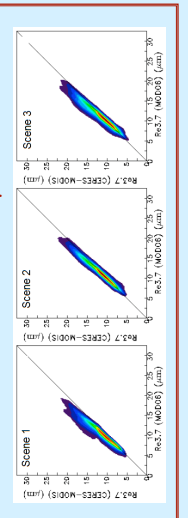
Comparisons of Various Mean Re from MOD06 C.005, C.004 and This Study for the Most Confident QC 1-km pixel Retrievals: One-day Global Ocean Area (2003.04.01)



Summary

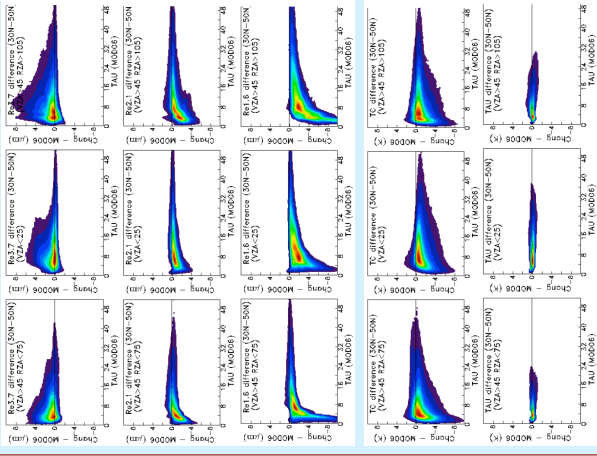
- Cloud droplet effective radius retrievals from different Aqua MODIS near-infrared channels (2.1- μm , 3.7- μm , and 1.6- μm) show considerable differences even among most confident QC pixels.
- π Both Collection 004 and Collection 005 MOD06 show smaller mean effective radii at 3.7- μm wavelength than at 2.1- μm and 1.6- μm wavelengths.
- π Differences in effective radius retrievals between Collection 004 and Collection 005 may be affected by cloud top height/temperature differences, which mainly occur for optically thin clouds.
- π Changes in cloud top height and temperature for thin clouds have different impacts on the effective radius retrievals from 2.1- μm , 3.7- μm , and 1.6- μm channels.
- π Independent retrievals (this study) show, on average, more consistency in the three effective radius retrievals.
- π This study is for Aqua MODIS only.

Case Comparisons of The MOD06 vs. The CERES-MODIS 3.7- μm Retrievals



Cloud Property Retrievals from This Study vs. MOD06: The Most Confident Plotted is Frequency of Occurrence (Warmer colors indicate larger FOC)

The Retrieval Differences vs. TAU: (warmer colors indicate larger FOC)



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Future Work: More data analysis will be made for both Terra and Aqua MODIS data. Global comparisons with CERES MODIS retrievals at all three wavelengths will be performed. All retrievals will be validated with the ARM ground-based effective radius retrieval data.



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