

Progress Report Grant NNX12AC62G

The focus of Grant “NNX12AC62” Titled Remote Sensing of Cloud Properties and Support Imagery during SEAC4RS with the Enhanced MODIS Airborne Simulator” is to:

- Prepare the software logistical support for the deployment of the eMAS
- Go into the field during the SEAC4RS deployment
- And then support post-field experiment validation and cloud product creation

In preparation of the the SEAC4RS field deployment which was delayed until the summer of 2013 we developed and tested the collocation software designed to merge the eMAS and Cloud Physics Lidar (CPL). We also developed the IR fast radiative transfer models needed for the cloud retrieval software. This work has been completed and delivered to the EMAS team members before the deployment EMAS. An example of the cloud products produced using this new model is presented in Figure 1.

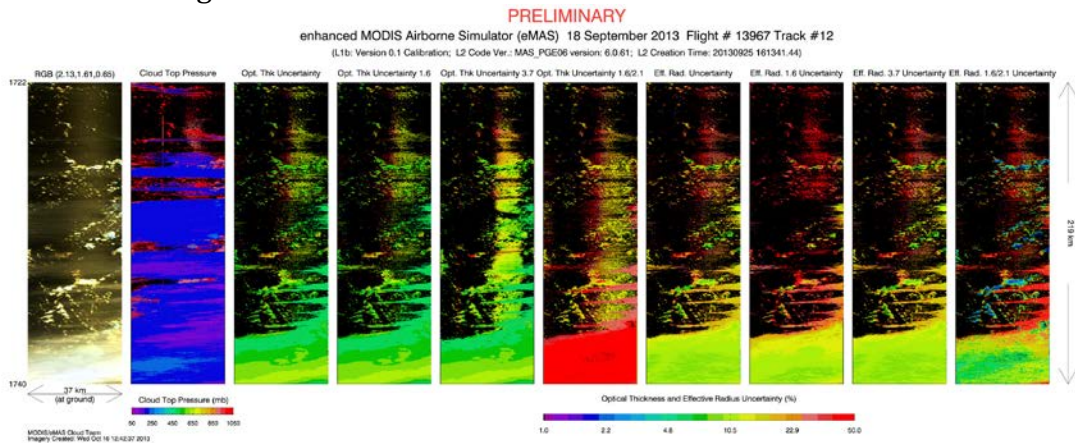


Figure 1 An example of cloud products produced from eMAS data during SEAC4rS. The IR fast model development supported by this grant is used as part of this retrieval package.

The grant also supported the development of a combined IR/Lidar cloud retrieval algorithm designed to leverage the eMAS/CPL collocation software. This new algorithm is designed to support the validation of the eMAS cloud products and help in the assessment of the IR calibration. An example of the IR retrieval is compared to the eMAS visible Cloud Optical Thickness (COT) retrievals is presented in Figure 2.

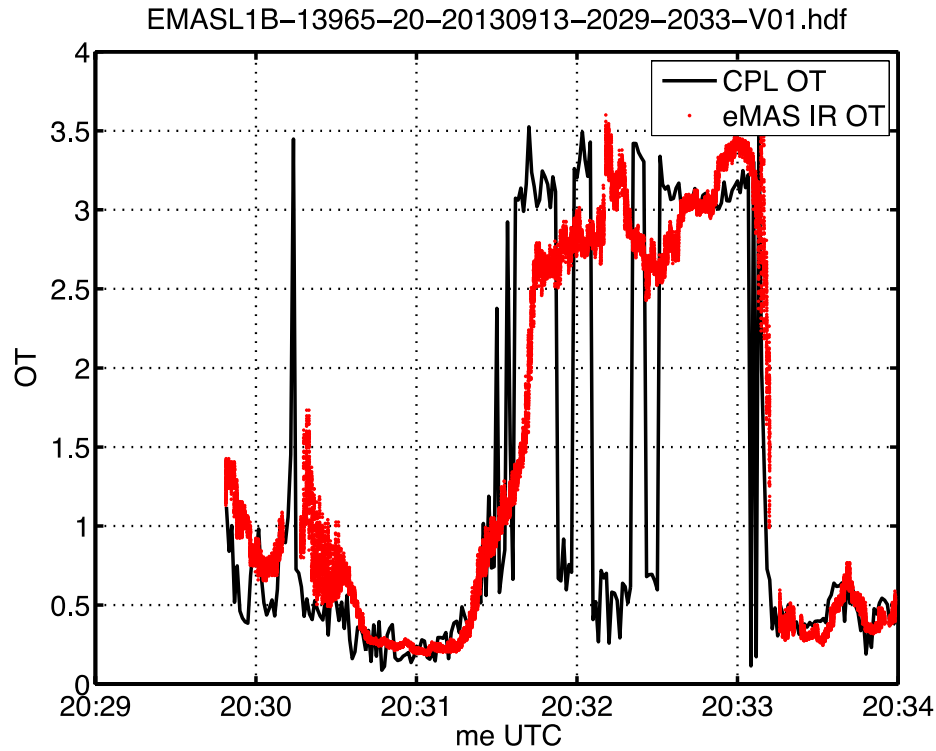


Figure 2 The new combined eMAS/CPL IR cloud optical thickness retrieval is compared to the eMAS visible retrieval for a SEAC4RS cirrus case study on September 13 2013.

We are currently working on processing the CPL/IR retrievals for the entire mission that will be delivered to the eMAS team early next year.

In addition to the aircraft collocation we have also developed collocation software to compare the aircraft observations with satellite observations. This capability is being used to help validate the radiometric calibration of eMAS. We currently support collocation with both VIIRS and MODIS imagers and plan to use this capability during post experiment validation flights scheduled for early next year (2015).