

## Minutes of NCEO-ORAC meeting, 6<sup>th</sup> July 2010, RAL

*Present: Chris Arnold, Dan Fisher, Caroline Poulsen, Andy Sayer, Richard Siddans, Gareth Thomas.*

### 1. ORAC clouds

Caroline reported back about the GEWEX meeting. Our high cloud amount is ok but we see too much mid-level cloud and not enough low cloud. This is through a combination of the boundary-layer inversion issue, and the radiative height of multi-layer clouds. Andy also suspects that the cloud-top heights stored in the GRAPE level 2 files have a bug (lower than they should be given the pressure/temperature) after comparing level 2 output with ground-based cloud height measurements and the ECMWF profiles used by the retrieval. Therefore for the final GEWEX submission deadline (Sept 15<sup>th</sup>) and the cloud validation paper Andy and Caroline are going to regenerate a fixed cloud-top pressure and height using the retrieved cloud-top temperature. This should be done by the next meeting.

We also see less optically-thin cloud than other sensors but this was previously known and the forward view should help.

Caroline has also been performing comparisons of (NASA) CALIPSO/CloudSat cloud properties with AATSR retrievals (using Richard's cloud model code). There are regular coincidences (within a few minutes) around 73° N. Our heights look quite good; CALIPSO/CloudSat also provide optical depth and effective radius. These don't compare so well unless you include the ATSR 3.7  $\mu\text{m}$  channel in the retrieval in which case it's better. Richard mentioned that we have/can get a similar CALIPSO/CloudSat product created by Reading University.

### 2. ESA Living Planet Symposium

Dan attended and reports that the cloud talks were mostly the same as given at GEWEX. The volcanic ash session included plume height estimates from GOME (on MetOp) although there wasn't a consensus as to whether they were accurate.

### 3. Student Progress

Haiyan was not present.

Dan has been improving the stereo matching algorithm using the 'phase correlation' method. This takes Fourier transforms of the image and matches on these, which should decrease the noise on the matcher and improve performance in low-contrast regions. The method takes ~3 minutes for an ATSR scene. He also prepared posters for and attended the GEWEX and ESA Living Planet meetings.

Chris has modified the GRAPE retrieval to run on a 4 km sinusoidal grid and has processed 1 day of retrievals using the nadir view only, forward view only, and sequential retrievals (using one view as the a priori for another). He has some early histograms of cloud optical depth although it is too early to say much. The order of views used in the sequential retrieval makes a difference. Richard suggests that passing the full covariance matrices at the retrieval solution is probably necessary for this and will explain some differences, because off-diagonals are likely to be nonzero.

#### 4. ADIENT

Gareth has been making level 3 daily GlobAerosol output on a 1° grid to provide to modellers. He has also been trying to define regions of different typical aerosol types to focus on for radiative forcing studies. Currently he has a map of 20 regions (2 polar, 9 oceans, and 9 non-polar land). He is currently waiting to hear back from Leeds before much more can be done.

#### 5. ESA CCI preparations.

Aerosol and cloud ECV kick-off meetings are coming up.

Andy and Gareth have begun processing of a 'first pass' at the aerosol test year of 2008. This includes the latest visible calibration (v14) and bias-correction (relative to MERIS). Gareth has written code to store the output in an updated version of the GlobAerosol NetCDF format. The processing is currently running on 4 nodes of midi and should take ~68 days to process the test year (assuming no problems).

Gareth is to circulate a draft code structure for the next version of ORAC to discuss at the next ORAC meeting. Following this we will schedule a meeting with Andy Smith to plan the redesign.

#### 6. Publications

Andy's ATSR sea surface reflectance model has been published in AMT.

Haiyan's GlobAerosol aerosol/wind speed paper has been published in ACP.

The GRAPE cloud algorithm paper is with Richard for comments, and he hopes to have this back to Caroline within a week.

The GRAPE cloud validation paper is awaiting the regeneration of cloud-top pressure/height, and subsequent regeneration of GEWEX files; Andy hopes to have a completed second draft around the time of the next meeting.

Andy has (finally) had review comments back for the Amazon aerosol paper (for the RSE ATSR special issue). The comments will require some substantial effort but he thinks they are fair. He intends to focus on cloud validation first.

Ralph Kahn and Fred Prata have been in touch with Gareth about collaboration on a paper on volcanic ash plume height for the ACP special issue on the Icelandic eruption (deadline May 2012).

#### 7. Date of next meeting

Set for Tuesday, 10<sup>th</sup> August, 10 am, AOPP Brewer Room.