

# A Rescope of the MODAL Project for Financial Year 2017

## Background

Models to Observations, a Digital Atmospheric Library (MODAL) was proposed as a strategic Laboratory Directed Research and Development (LDRD) project at the end of FY15 to start in FY16. The original project envisaged a set of atmospheric scenes generated through LES (with sophisticated data assimilation) with associated observational data sets. This would then be coupled to a set of instrument simulators which would allow virtual configurations of atmospheric observatories.

As MODAL was funded at just under 60 percent we focused more on quickly modelling a pure maritime cloud field using WRF LES and a sounding from the RICO [1] field campaign and running a simple radar simulator to investigate the impact of sampling on retrieved cloud fraction.

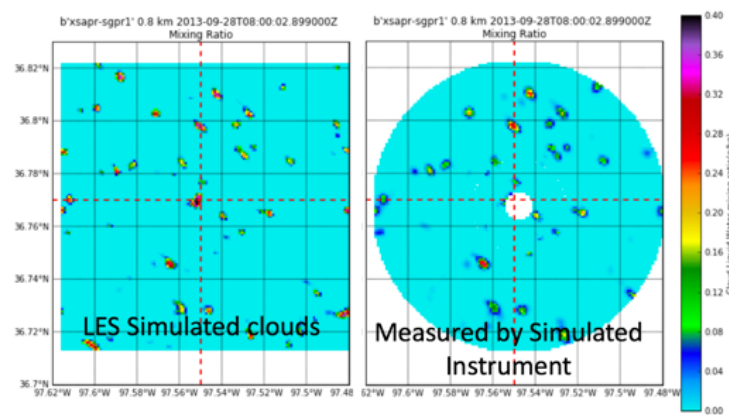


Figure 1: As example of LES Simulated clouds and radar sampled then re-gridded clouds.

Figure 1 shows modelled cloud liquid water content from WRF-LES on the left and a retrieved cloud field from a conically scanning cloud radar on the right. Many radars map out a 3D volume in space by scanning in a nested conical fashion. Figure 2 shows the increasing error in retrieved cloud fraction as a function of height and also as a function of the number of nested cones.

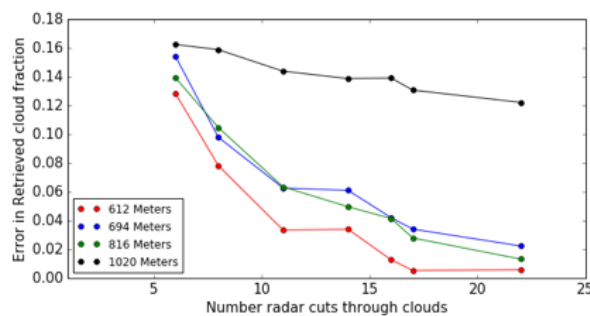


Figure 2: Error in cloud fraction as a function of height in the model domain and number of elevation angles in a conical scanning pattern.

This initial work has allowed us to investigate the errors in retrieved cloud fraction due to under-sampling and is an early demonstration of the potential of MODAL.

During FY16 we also attempted to recruit postdoctoral talent to the team. This became very complicated when the leading candidate turned down the offer of employment and various runner-up candidates had already secured positions leaving us with under qualified candidates. Fortunately we secured a highly qualified candidate in Gökhan Sever who, after a series of visa issues, will be joining us October 3rd.

# References

[1] NEED RICO