

CPEX Mission #15 23 June 2017 Takeoff ~ 1654 Landing ~ 2138 UTC

Mission Scientist Report (Ed Zipser, 19 August 2017)

Pre-takeoff objective was to target a region of undisturbed trade cumulus east of the Bahamas to obtain the best possible DAWN winds in pre-planned boxes, not only for DAWN testing and QC, but if possible repeat in a second box nearby with cumulus congestus and evaluate whether slight changes can be observed in low-level convergence, thermodynamic profiles, or both.

Results: Actual mission carried out almost exactly as planned. After the usual DAWN calibration run over Florida shortly after takeoff, headed east, and executed first box centered near 25.6 N 74.6 W, about 40 nm on a side, with mostly small trade cu, tops no deeper than 7-8000 ft. but mostly much less, aligned in rolls oriented from about 120°. Then did a two passes around a second box a little to the east, centered around a taller congestus first identified on VIS satellite by ground scientist. After completing second box, 4-5 passes made over the group of congestus for APR-2. Lastly, returned to location of first box, and repeated it to look for consistency or changes, if any.

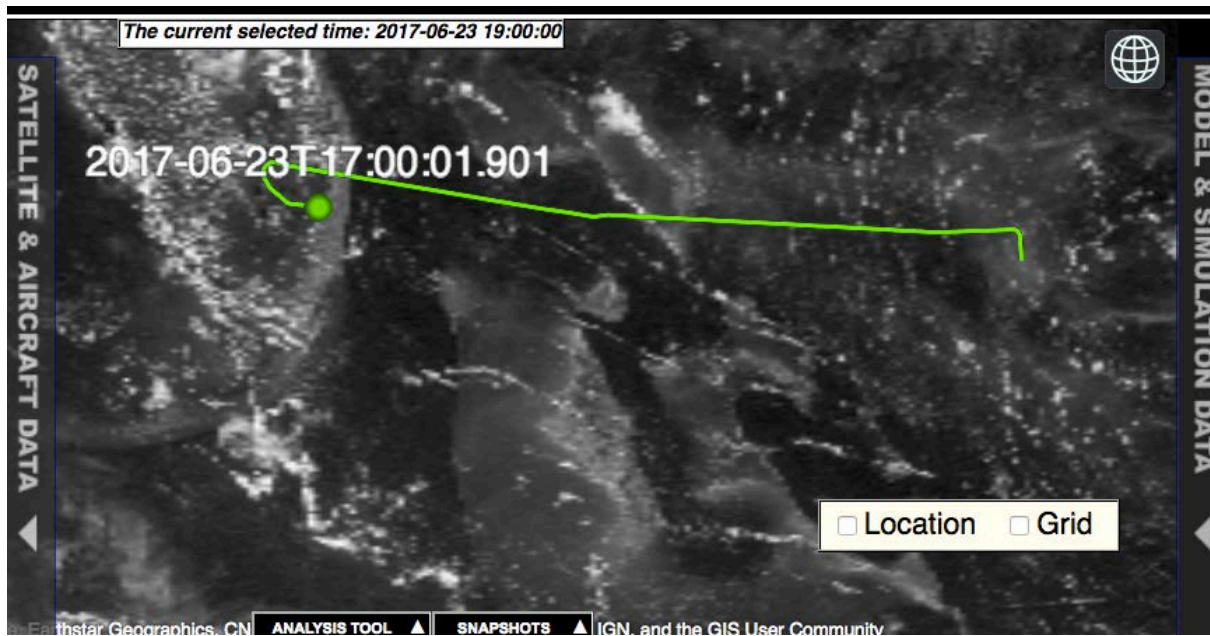


Fig. 1. Flight track 1700-1800 Z, showing start of Box 1 to turn on NE corner.

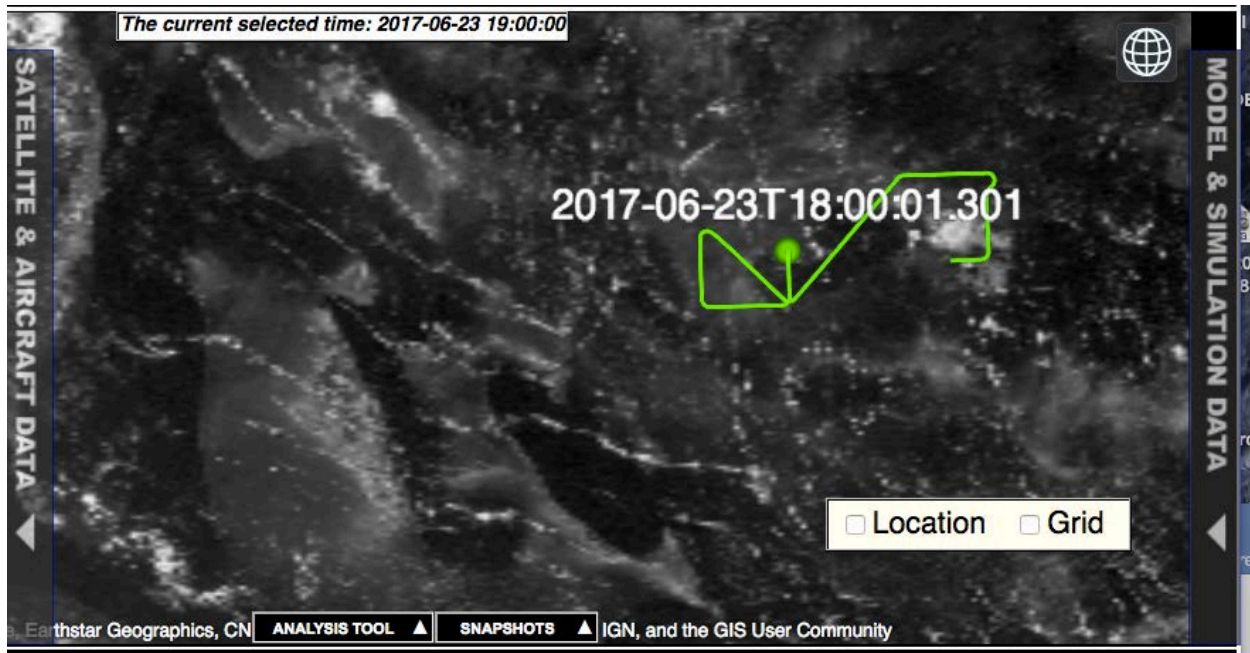


Fig. 2. Flight track 18-19 Z, showing completion of first box including diagonal leg, followed by first 2.5 legs of second box. Note that the cloud patch in the VIS image is stratocumulus and not cumulus; that is most likely the small bright spot west of the stratocu patch.



Fig. 3 (left). Photo about 1753Z of typical conditions inside Box 1



Fig. 4 (right) Photo about 1758Z of typical conditions inside Box 1.



Fig. 5. Photo about 1804Z showing PBL rolls oriented about 120-130°.

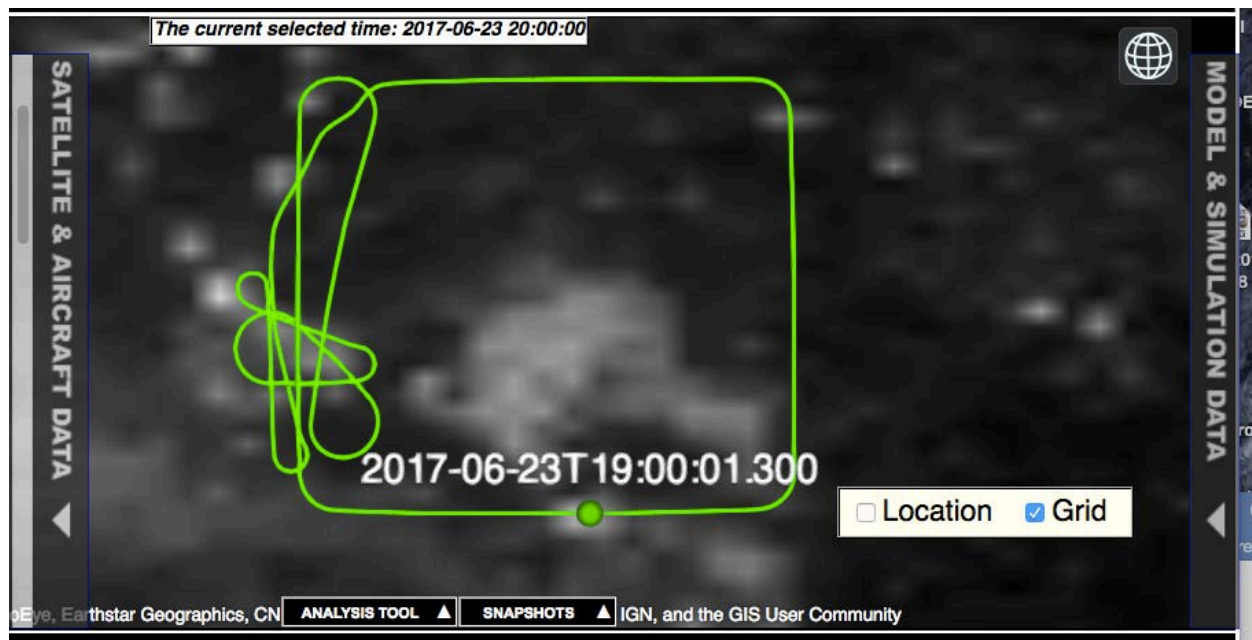


Fig. 6. Flight track 19-20Z, showing completion of first track around Box 2, AND the second box. This was followed by 4-5 overpasses of the cumulus congestus group between about 1917-37Z. See APR-2 for excellent quick look data on these cumuli; heights to 4.4 km, 45 dBZ at Ku band.



Fig. 7. Looking north into second box across large stratocumulus patch at about 1901Z

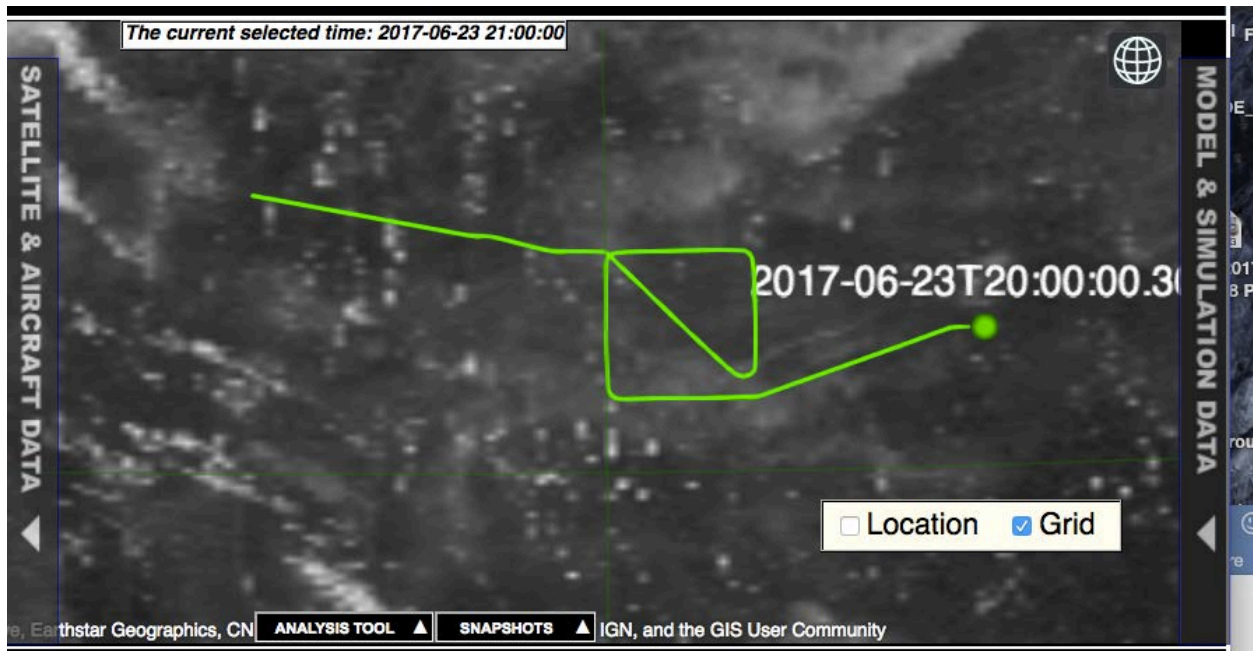


Fig. 8. Flight track 20-21Z, showing the repeated execution of the box around the suppressed trade cu area



Fig. 9. Toward ENE about 2021Z looking into center of 2nd box during 2nd circuit of that box.

2017-06-23T20:41:02.000Z

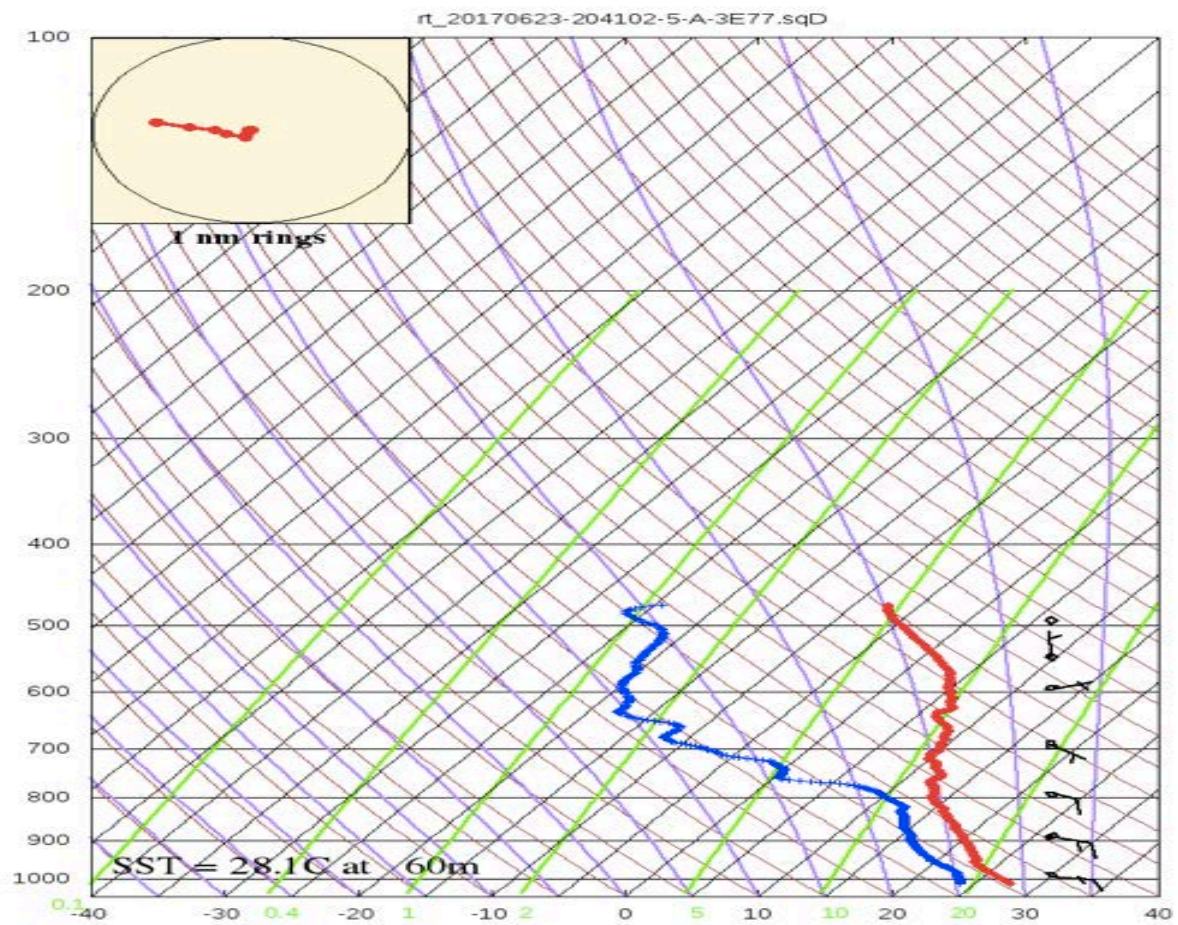


Fig. 10: Quick Look Dropsonde plot near 2041Z, near center of second box, second circuit.