May 24 Mission Science Report

Submitted by snesbitt on Wed, 05/25/2011 - 06:19
Flight Date:
Tue, 05/24/2011

Today's aircraft mission included a complex scenario with targets in Colorado, Kansas and Oklahoma. Concerns over weather conditions at Offut before and during the ER-2 mission further complicated the ER-2 mission.

The ER-2 launched at 18:55 UTC, one hour later than the scheduled time due to weather over the Offut airspace. Initially, the ER-2 proceeded east into Greely CO (location of the CSU-CHILL radar) for a mission over Colorado and the CSH-CHILL radar facility. ER-2 sampled the precipitation in Colorado along preset RHI legs discussed among the mission scientists, Steve Rutledge and CSU-CHILL personnel after the completion of the morning weather briefing (Fig. 1). ER-2 reached D point around 19:58 UTC. The ER-2 tracks are D-X-E-X-D. ER-2 sampled thick anvil while the CSU-CHILL sampled the same anvil (Fig. 2). Note the skin paints of the ER-2 in the cross sections, noting the excellent coordination of the flight legs planned by the CSU-CHILL radar facility (image courtesy Pat Kennedy).

First convective cells fired up along the dry line in southwest Oklahoma around 19:10 UTC in a southwest to northeast direction. The Citation launched at 20:21 UTC to the south with an ascent to 25 kft and an aerosol profile was accomplished ahead of the convective anvil (complete at 20:40 UTC). The Citation then moved over the ARM CF for a spiral down (20:48 UTC) and then spiral up (21:00 UTC) profile while the ER-2 was directed to proceed to Oklahoma to sample just ahead of the well developed convective line. The Citation reported high turbulence and updraft at -25°C with a lot of supercooled liquid at the ARM CF. The Citation spiral over the CF ended at 21:28 UTC. Citation was then guided over NPOL and then set on a N-S stacked leg sampling the anvil at 9.5 km and later 8.5 km. ER-2 got into OK at 21:52 UTC and start sampling the convective line (moving south). The Citation repeated a new N-S leg in the anvil at 28 kft.

At 22:03 UTC, the Citation started the last northerly leg in the anvil (25 kft) and then back to base Ponca City airport just ahead of the leading edge of the convective line. The ER-2 moved south, crossed the convective line near OKC, then traversed the line sampled by the Citation to the east and north, then returned back to Offut (Fig. 3) due to concerns over landing conditions. The forecast was very accurate and special thanks to Scott Giangrande for nowcasting weather conditions at Offut while ER-2 was operating across three states. The aircraft-ground coordination at Colorado was excellent and flight lines were executed well. Despite somewhat limited stacked ER-2/Citation flights in Oklahoma due to the weather bearing down on both aircraft for safe landing, the OK data should prove to be an excellent case of intense convection sampled by the ER-2 (Fig. 4, showing VIS/IR presentation of the cells as they were sampled, courtesy U. Wisconsin/CIMMS) and some coordinated sampling of forward anvils produced by severe convective cells.

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Attachment	Size
fig1.jpg	83.05 KB
fig2.jpg	79.04 KB
fig3.jpg	143.68 KB
fig4.gif	886.41 KB