

**HiCu03 30808 (Friday) Drew-Vali-Damiani-Glover**

- 0730L Calling for 11 am T/O, based on similarity to preceding days, moisture flow from the SW and with the goal of sampling before cloud field gets too dense. Actual situation: left-over cloud civer over the valley, denser to E. MB profiler shows wind from W to 1km agl.
- 1030L Photos from ramp. Cu have been appearing over the Bows; weaker line on E side, stronger one seen on the W side.
- 1645 LAR variable/03 30.36 dens alt 9500
- 1649 taxi
- 1651 T/O  
CB=13 kft at the lowest
- 1658 **A1** passed while continuing to climb toward 20 kft. *UD*. Weak, disjointed echo. ~0.2 g LWC.
- 1703 at 20 kft (29..91); turning back, descending to 14–18 block. Will go to N end of line and follow the line to SE at 16 kft.
- 1707 sampling line which includes A1;  $-1.5^{\circ}\text{C}$
- 1709 reverse to NW at 14 kft, sample cells on W side of line --- very weak
- 1712 end of run to  $340^{\circ}$ , still *UD*; will reverse
- 1718 end of run to SE; will climb to 16 kft and do *SD*
- 1721 target on right
- 1722 setting up for SS; note that probe heats are just getting turned on; weak line with SS 1723–26.
- 1726 moving to Saratoga valley where clouds are much deeper and more vigorous, change to *UD*.
- 1731 **B1** with 10 m/s at 17 kft *UD*.
- 1735 **B2**, *UD*
- 1738 **B3** with *SD*
- 1740 **B4** with SS after 180 turn, no yellow on nose radar
- 1742 **B5** with *UD*; large yellow on nose;  $-3.5^{\circ}\text{C}$
- 1747 **B6**; dissipating
- 1750 looking for a new target
- 1752 target **C1**,  $4\text{ ms}^{-1}$ ,  $400\text{ cm}^{-3}$  *UD*
- 1754 up to 22 kft and set up for *DD*
- 1758 **C2** *DD* from 22 kft
- 1803 **C3** below and then pass over yet another cell
- 1805 **D1** pass through tall skinny tower; still with *DD*; had  $5\text{ ms}^{-1}$  for brief pulse, but  $2\text{ g m}^{-3}$  and  $700\text{ cm}^{-3}$   $-15.7^{\circ}\text{C}$ ;  $90/270$  for next passes. See photos page 4, #293 and #294
- 1807 **D2** – weaker; see photo page 5, #295; cold core -- talk about evaporation !!!
- 1809 **D3** – collapsing, downdrafts, cold core, ice to  $20\text{ L}^{-1}$ ; photo page 5, #296; all of **D** with *DD* ---> good case of rapid decay and ice dev't linked to evaporation !!
- 1816 moving NE to E side of range; looking at line of 3 cells
- 1817 Double cellll with *DD*; half warm half cold core in correspondence with LWC. Then rutned off by Center
- 1821 **E1** narrow turret emerging from larger mass, *DD*, not much punch, cold core

1824 **E2**, ice and cold core with downdraft, *DD*  
1827 **E3** residue with  $5 \text{ ms}^{-1}$  down and ice; *UD* – echo extends ~1 km above  
1835–6 cruising through layer at 18 kft,  $-6^{\circ}\text{C}$ , with *UD* – sort of background info  
1839 idling to wet CCN pads  
1846 desc to 14 kft  $+3.5^{\circ}\text{C}$  and start CCN spectra under succession of cells, while also looking *UD*  
1852 past last cell,  $180^{\circ}$  left. start second CCN leg  
1857 end CCN; target ahead, climb to 17 kft; CB=15kft  
1859 at 17 kft  $-3.5^{\circ}\text{C}$ ; all downdrafts; weak echoes, some with echo well below cloud base, virga not visible by eye.  
1901 **F1**, brief  $5 \text{ ms}^{-1}$  up, near  $1 \text{ g m}^{-3}$  and  $1000 \text{ cm}^{-3}$ ; *UD*  
1903 butterfly pattern for **F2** aiming at center of cell  
1905 **F3** through center  
1907 climb to 19 kft for **F4** (at 190820)  
1910 **F5** with *SD*; weaker, more ice  
1914 **F6** with *SS*; area getting a bit more cluttered so visual identification is uncertain and pointer changes from offset to no–offset are confusing; likely to be OK but to be sure the track will have to be untangled post–hoc.  
1917 **F7** with *DD*; echo base about 800 m below  
1919 **F8** with *UD*  
1922 **F9** with *UD*, though clouds have merged around **F**.  
1923 end of sequence, changing to VFR and going to Lake Hattie for calibration maneuver.  
1933  $45^{\circ}$  right turn aiming the side beam at the lake; event 4 for start and end; then  $45^{\circ}$  left with down–beam; again event 4 used. Virga may be interfering – it is weak to the eye, but has strong reflectivity.  
1938 L/D.

#### NOTES:

Main interests in this flight are the strongly evaporating towers, the less deep and weakly precipitating Cu+, all of which were well sampled. Drop conc. (many at 600, few at 1000) and presumably CCN counts were lowest in recent flights though by not much. Ice development sparse.

There was a striking difference between the previous day and this one in the frequency of lightning. Yesterday it was everywhere. Today I didn't see any lightning, until about 5pm=23Z from the office window. The flight was earlier in the day, but that is not the full story.

Following day, the 9th, mid–level cloud residues persisted until mid–afternoon and there no significant Cu developed in the region. Hence, the change between the 7th and the 9th is in the same direction. Line of Cb's at 2215 on the 9th extends from southern CO to eastern SD. There are small Cu and Cb's behind, just much less than yesterday.