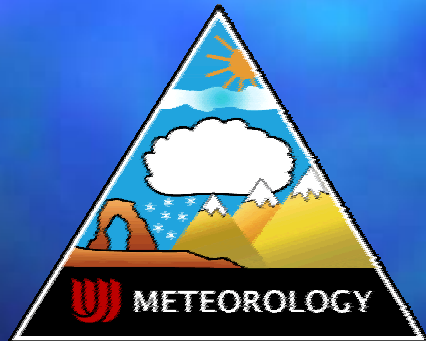


Highlights of Potential Case Studies from CAMEX-4

March 14, 2002



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University of Utah

University of
Utah

Short List: Case Study Opportunities



- Chantal: Intense convection, asymmetric
- Erin: Outstanding snapshot of mature storm
- Gabrielle: Landfall, rain, slow to reintensify
- Humberto: 3 consecutive days excellent coverage; persistent asymmetry with strong convection on north side; intensity change
- KAMP: 19 Sept for combined surface-based radars plus aircraft; 7, 9 Sept for a/c data

Why Didn't Chantal Intensify?

Larger Context: What are some of the unanswered questions about intensification?



- What is the relative importance of external influences vs. internal processes?
- Are strong convective rainbands good or bad?
- Is intense convection near the developing eyewall a necessity or just a side effect?
- Is asymmetry a hindrance to intensification? Why or why not? Always or just with certain storms?
- Boundary layer processes; role of downdrafts, evaporation of spray in preventing high theta-e core

External Influences on Intensification Getting beyond 'good' trough vs. 'bad' trough and 'high SST good, high shear bad'



- Gabrielle failed to intensify over the Gulf Stream on 15 Sept. Why?
- Humberto intensified smartly between 22-23 September over not-so-warm water and in spite of shear and asymmetrical convection. (concentrated on north side). Why?

Humberto - COVES Mission



- If we can't sort out external influences vs. internal processes in Humberto's case, it won't be for lack of data.
- 22 Sep. data is during rapid deepening with no little precip on south side.
- Distribution of convection is not unlike that of Bonnie on 23 Aug 98 but storm history is very different.

Short List: Case Study Opportunities



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OMISSIONS!!!



- Microphysics!
- PR-2, rain estimation, KAMP radar suite, polarimetry, TRMM algorithms....
- Strat-trop exchange, dehydration.....
- JPL Hygrometer data; LASE data; using the full database to describe moisture changes..
- Feedback between observational folks and modelers as integral part of case studies

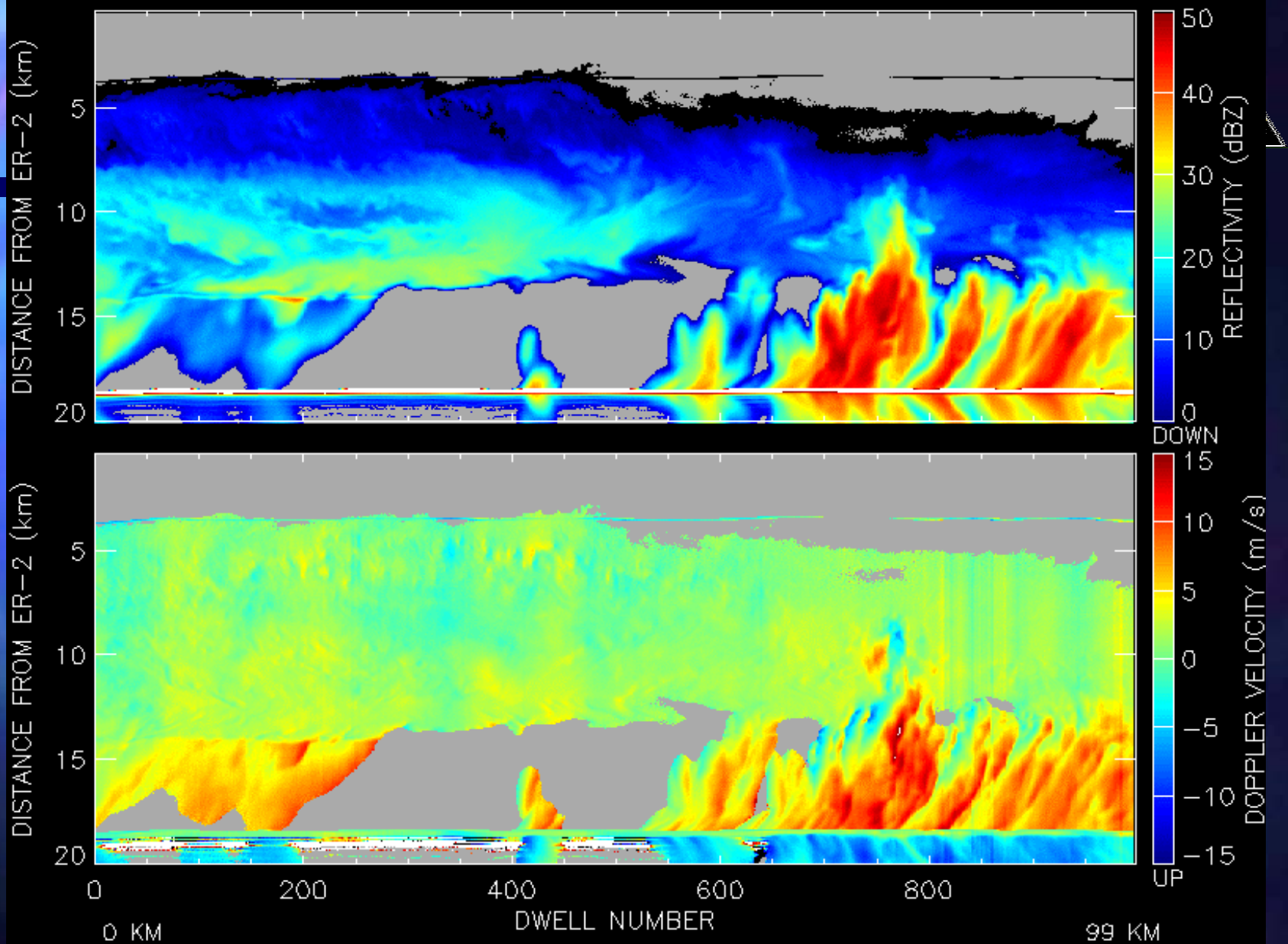
Case Study Opportunities: Working Together as a Team



- We have much to learn from each other
- Meteorology of storms provides context for contributions using data from all instruments
- 'First round' papers can't be comprehensive
- 'Second round' papers should build on first round results, CAMEX-3 results, and more...
- Value of our research in solving long-standing problems depends on continued partnerships

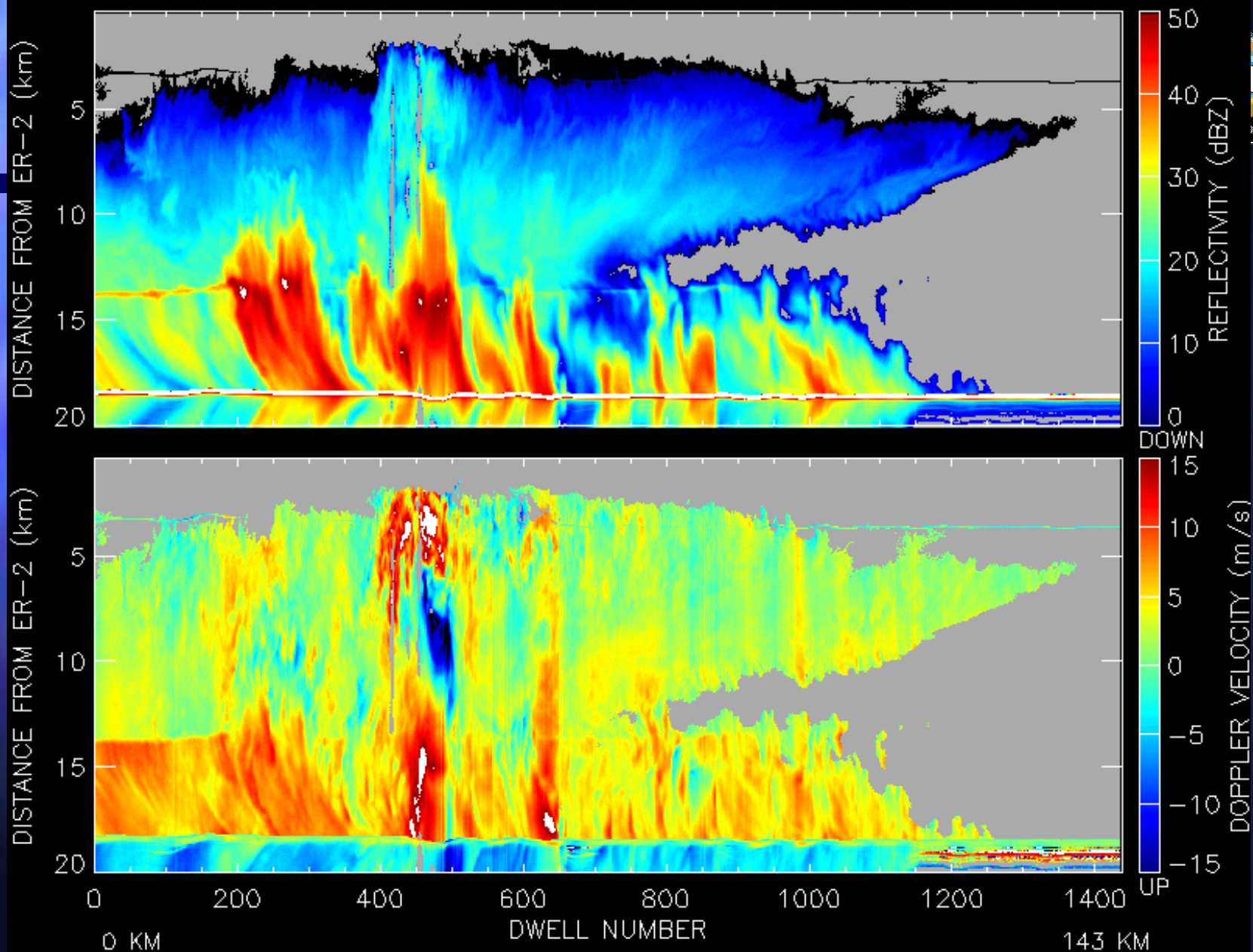
Preliminary data

EDOP 8-20-2001 20:49:55 -- 20:58:21 UTC NADIR



Preliminary data

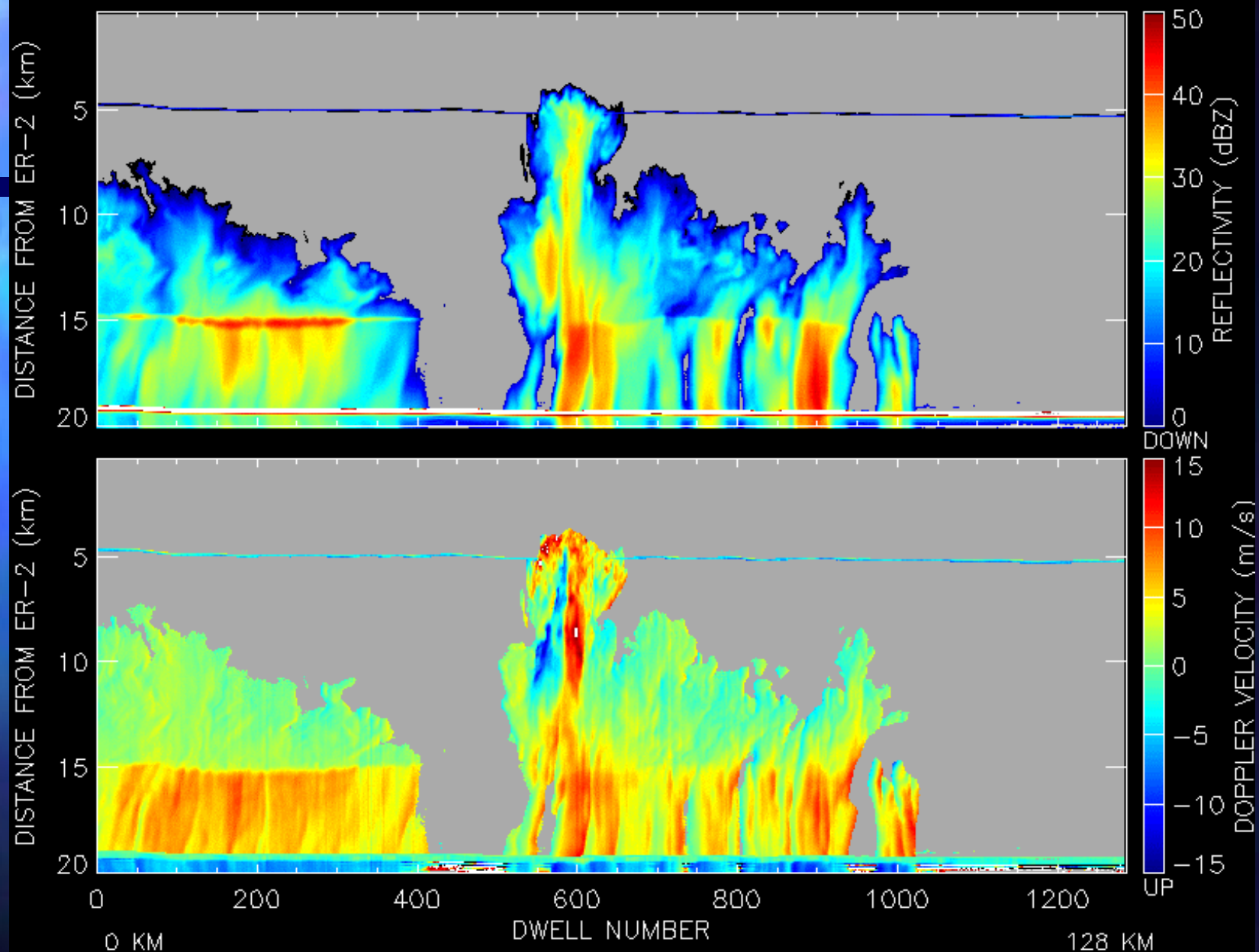
EDOP 8-20-2001 21:13:38 -- 21:25:47 UTC NADIR



camex4/bin/8-20-01/010820_2113-2125.bin_RAD1 Noise Removed

Preliminary data

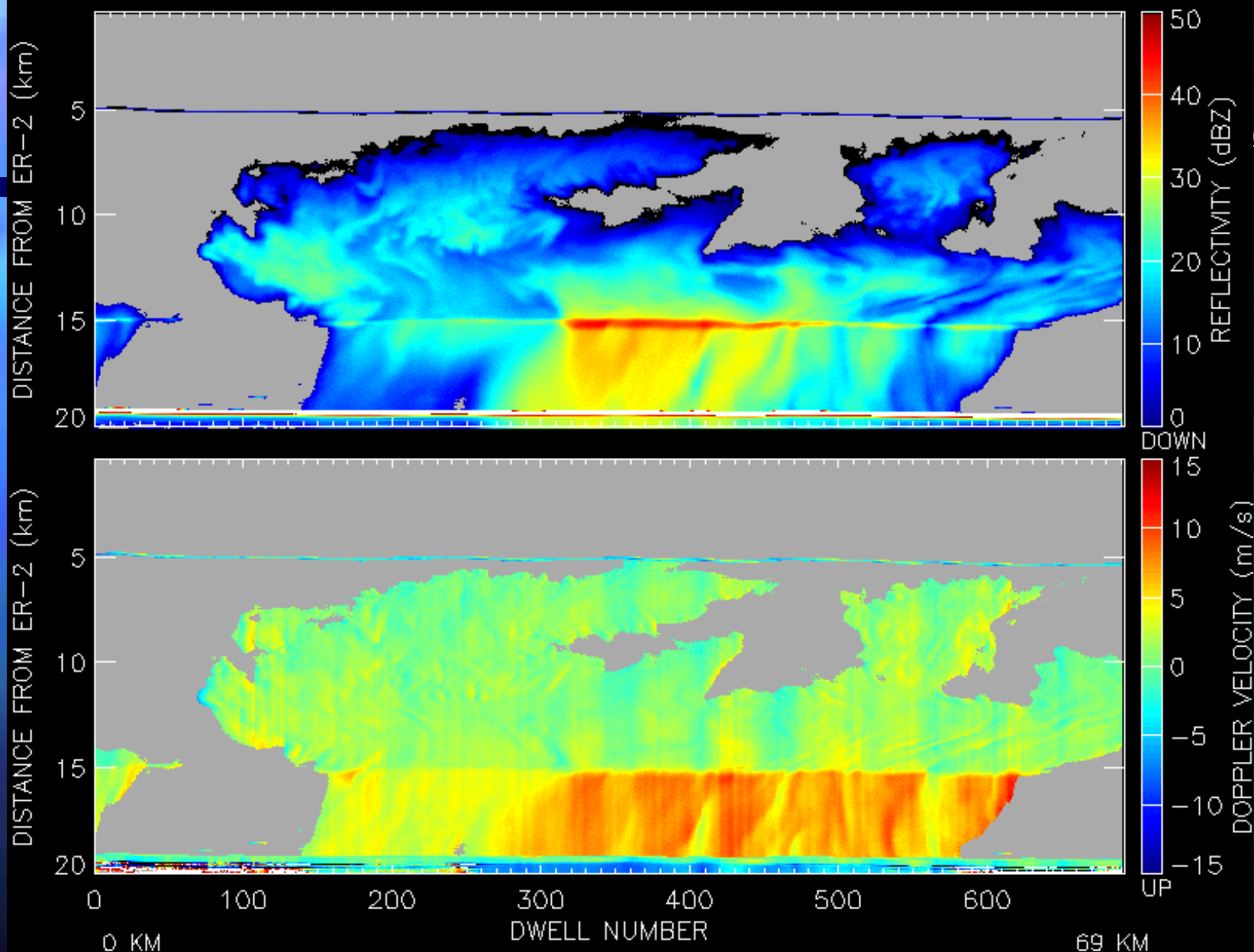
EDOP 9-7-2001 17:31:51 -- 17:42:43 UTC NADIR



0 KM 128 KM
cames4/bin/9-07-01/010907_1731-1742.bin_RAD1 Noise Removed

Preliminary data

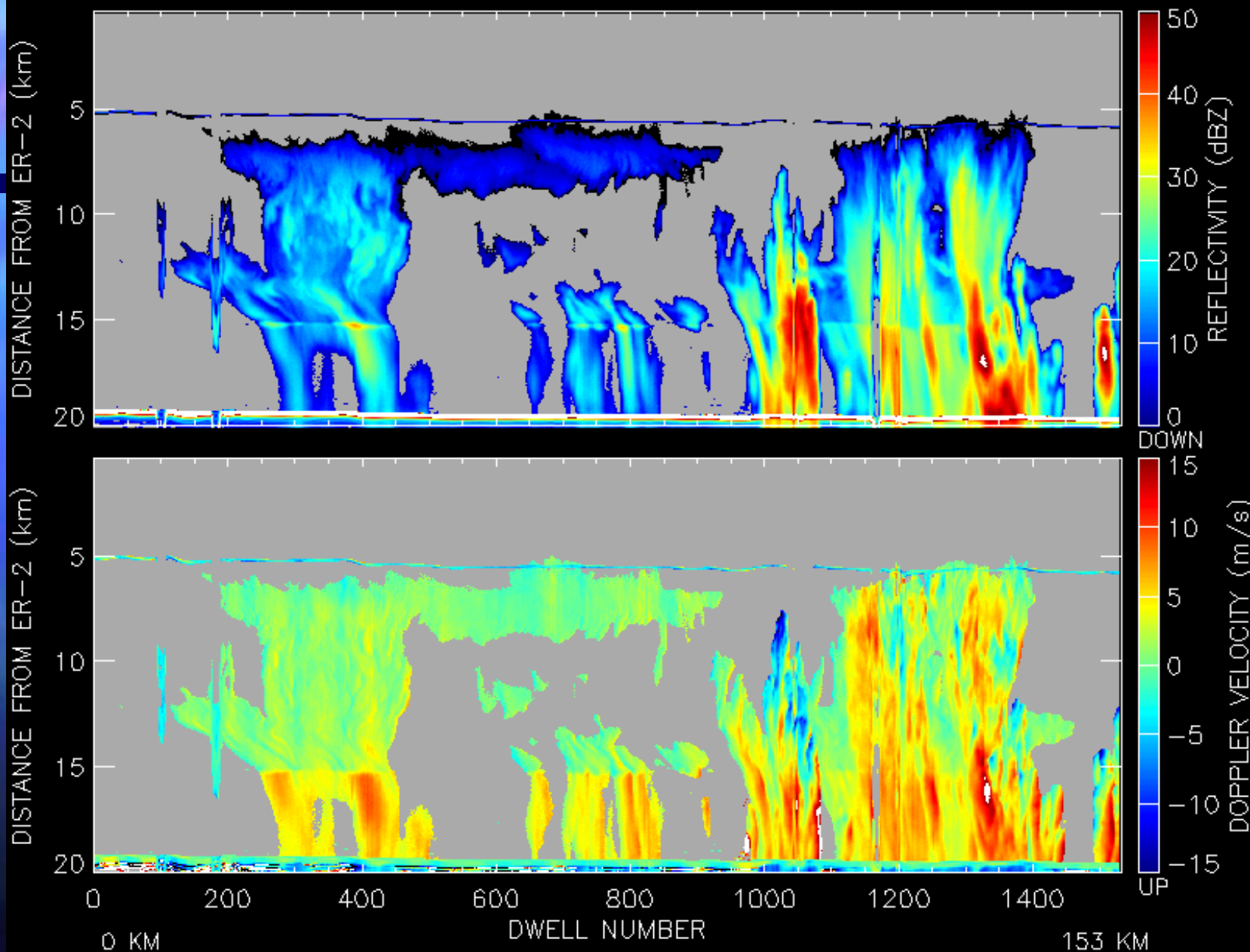
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camex4/bin/9-07-01/010907_1830-1836.bin_RAD1 Noise Removed

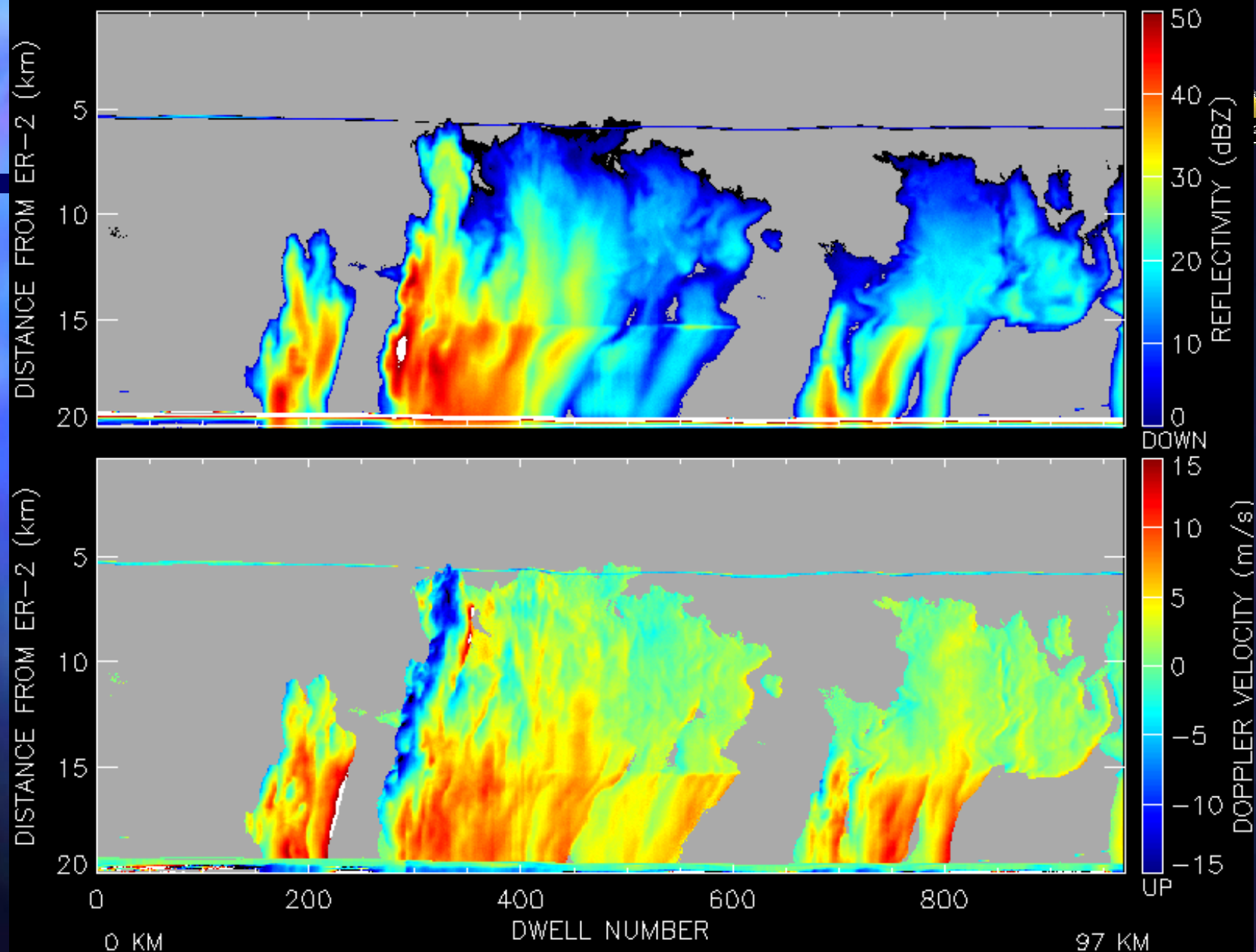
Preliminary data

EDOP 9-7-2001 18:42:6 -- 18:55:2 UTC NADIR



Preliminary data

EDOP 9-7-2001 19:0:6 -- 19:8:17 UTC NADIR



camex4/bin/9-07-01/010907_1900-1908.bin_RAD1 Noise Removed

The Advanced Microwave Precipitation Radiometer (AMPR)

Image from CAMEX-4 "KAMP pass 4 of 8"

19 Sep 2001 (262) 18:08:26-18:16:11 UTC

Frequencies in GHz

Cross-Track Scan (L-to-R in direction of motion)

$$V[\cos^2(\theta+45^\circ)] + H[\sin^2(\theta+45^\circ)] = 1$$

Grid Center: 24.75°N x 81.25°W

Grid Resolution: 1.00 km

NASA/NSSTC/GHCC Version 1.0

Some data may have been interpolated

Elevation in Meters

0 250 500



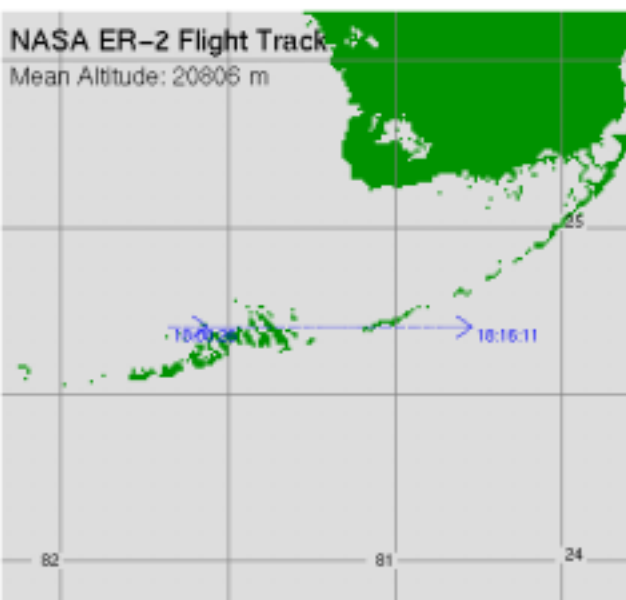
Source: United States Geological Survey
Digital Elevation Model (DEM)

Brightness Temperature in Kelvin

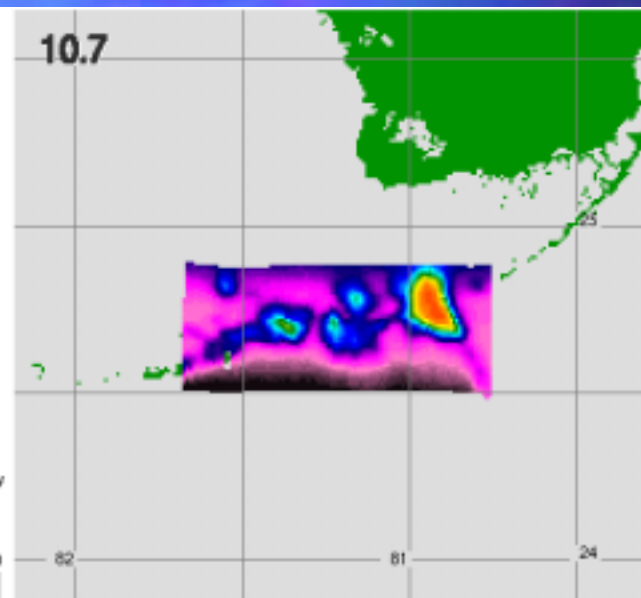


NASA ER-2 Flight Track

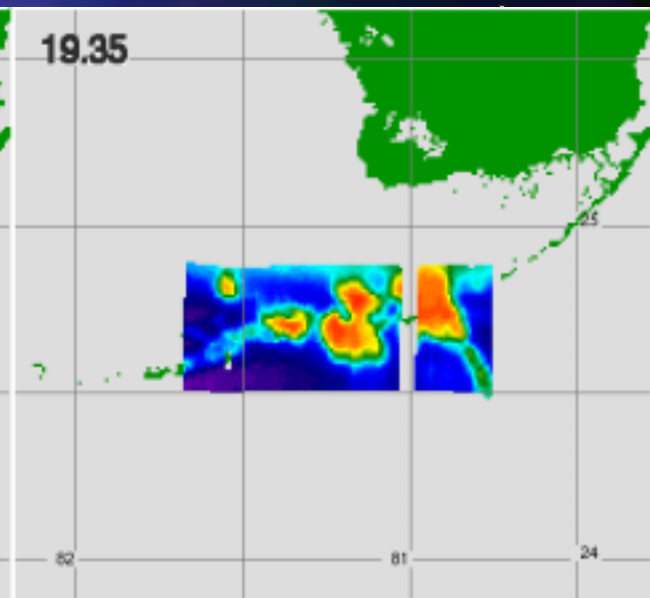
Mean Altitude: 20806 m



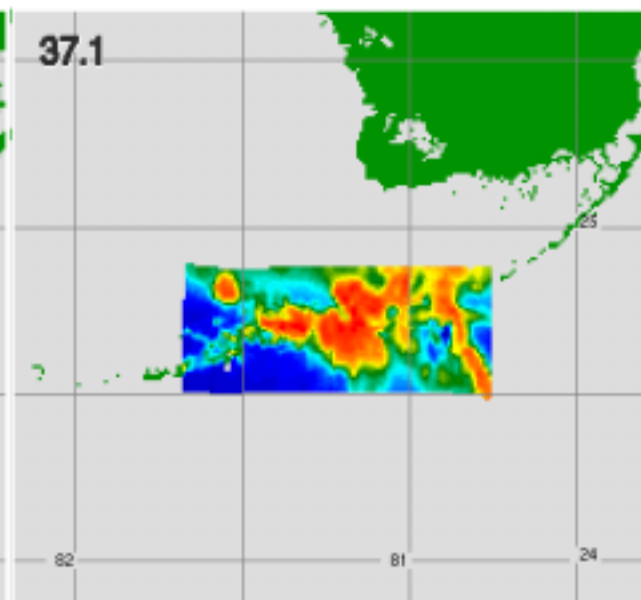
10.7



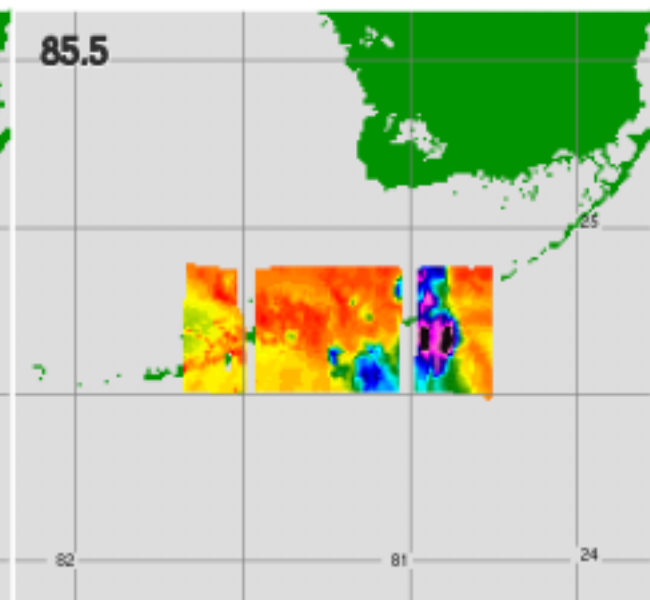
19.35



37.1

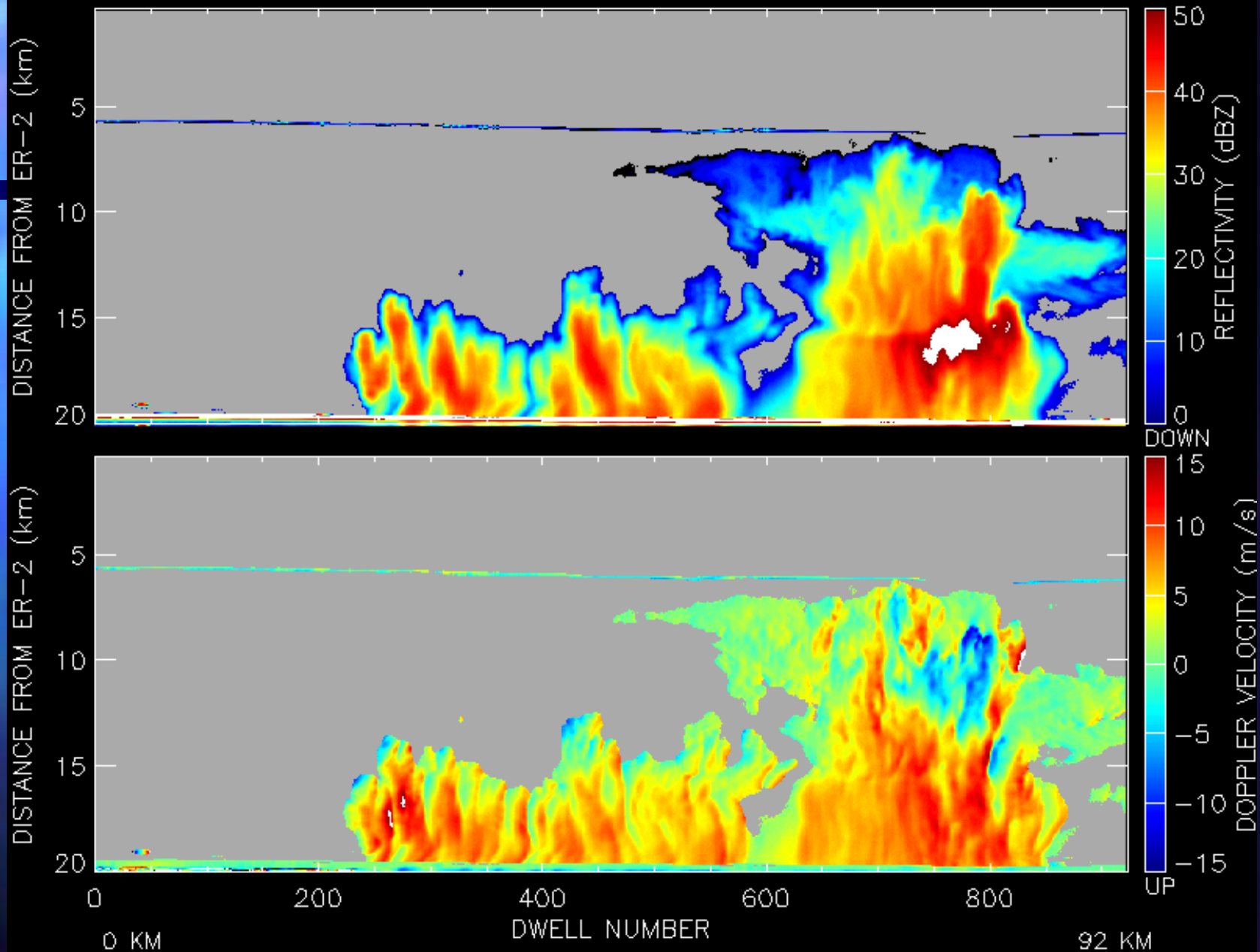


85.5

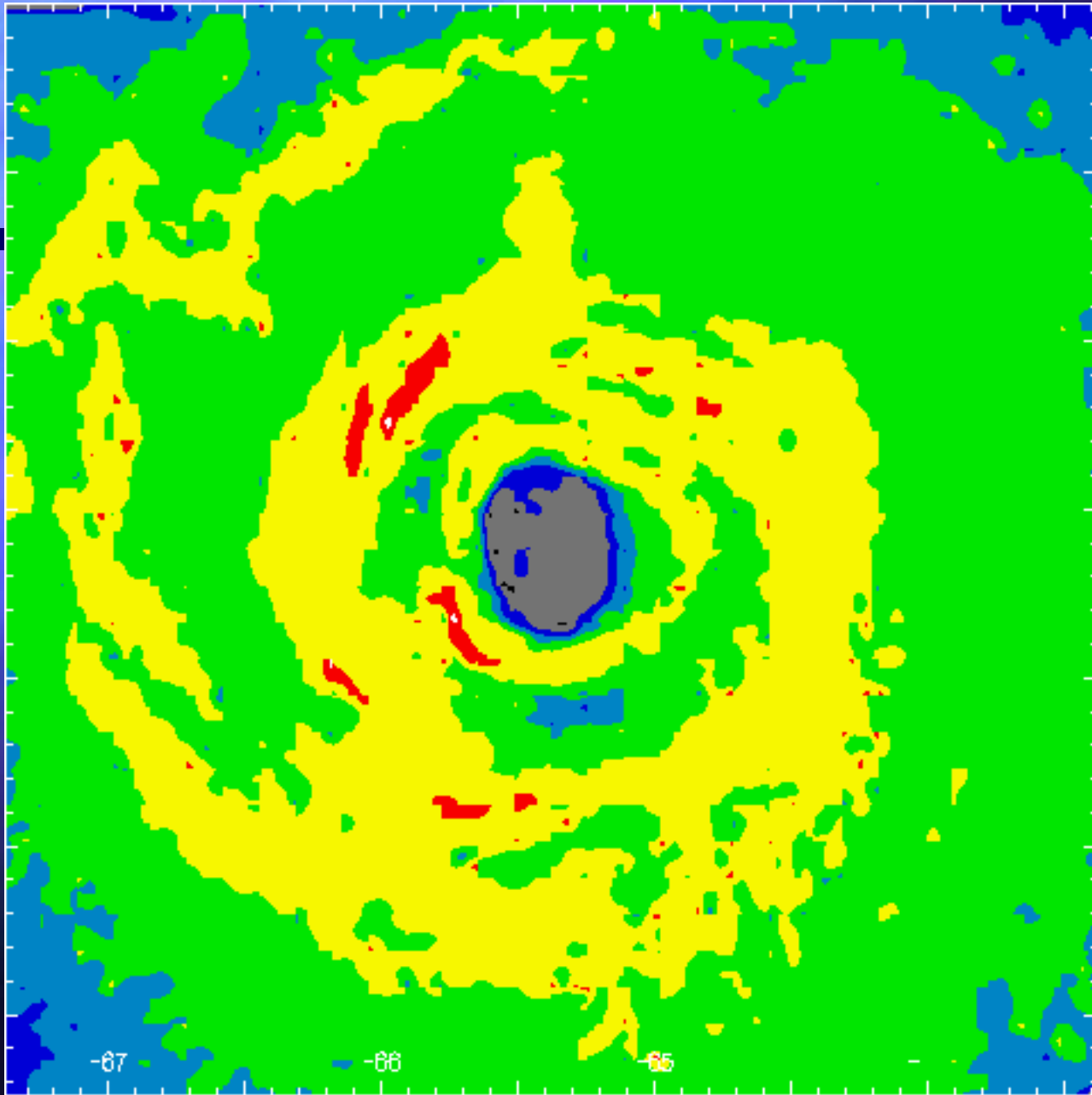


Preliminary data

EDOP 9-19-2001 18:8:25 -- 18:16:12 UTC NADIR



camex4/bin/9-19-01/010919_1808-1816.bin_RAD1 Noise Removed



01091001

ERIN

191013 Z to
192858 Z

48	
41	
36	
28	
21	
15	Alt 4244 m
dBZ	Slat 35.89 N
	Slon 65.38 W

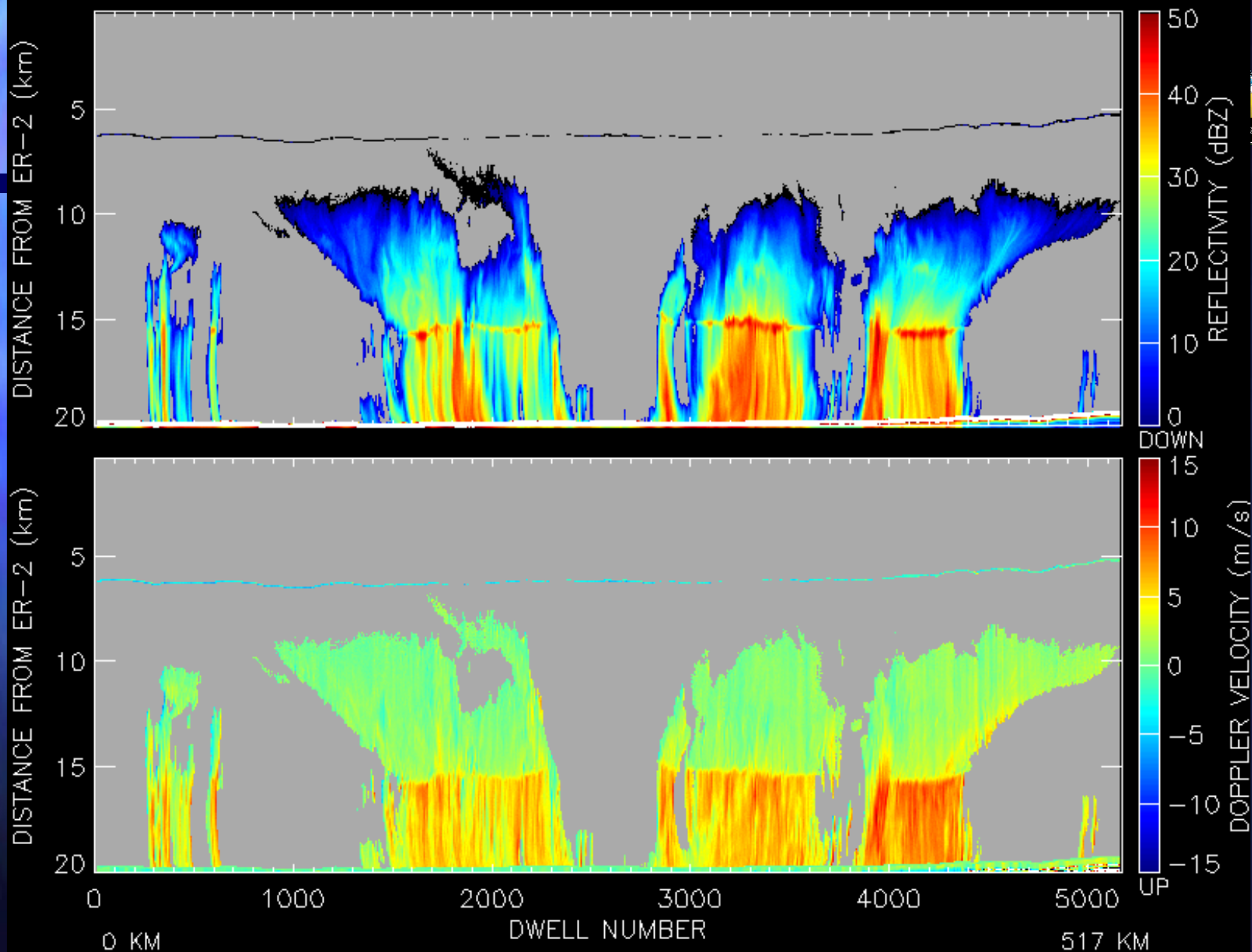
360 X 360 km

produced by
HRD / AOC

-67 -68 -69

Preliminary data

EDOP 9-10-2001 19:6:48 -- 19:50:33 UTC NADIR





The Advanced Microwave Precipitation Radiometer (AMPR)

Image from CAMEX-4

22 Sep 2001 (265) 19:30:44-19:47:43 UTC

Frequencies in GHz

Cross-Track Scan (L-to-R in direction of motion)

$$V[\cos^2(\theta+45^\circ)] + H[\sin^2(\theta+45^\circ)] = 1$$

Grid Center: 29.00°N x 66.50°W

Grid Resolution: 0.83 km

NASA/NSSTC/GHCC

**** PRELIMINARY ****

Some data may have been interpolated

Elevation in Meters

0 500 1000



Source: United States Geological Survey
Digital Elevation Model (DEM)

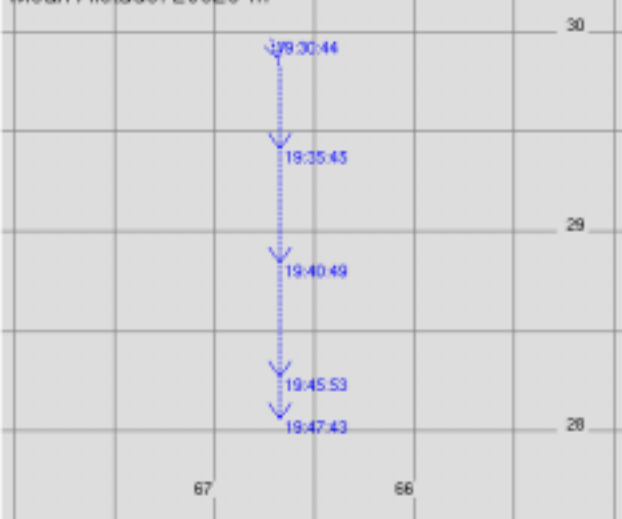
Brightness Temperature in Kelvin

100 120 140 160 180 200 220 240 260 280 300



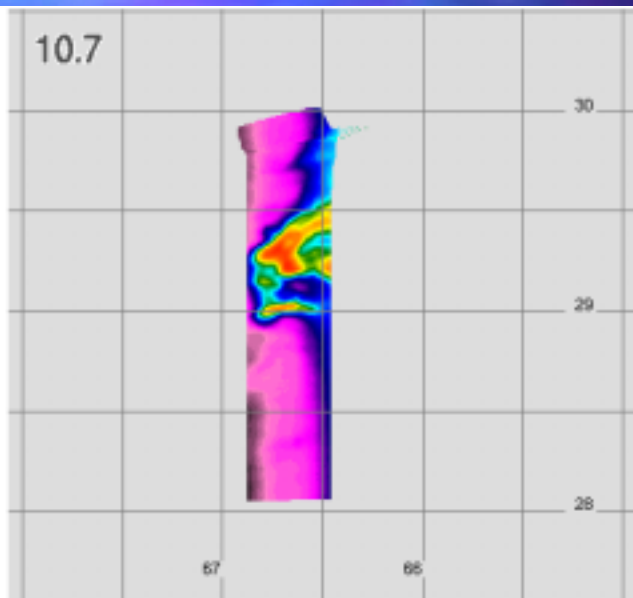
NASA ER-2 Flight Track

Mean Altitude: 20628 m

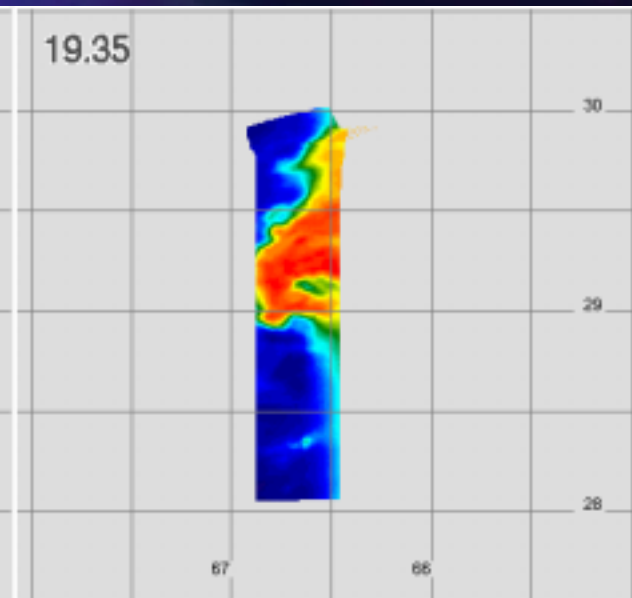


McIDAS based

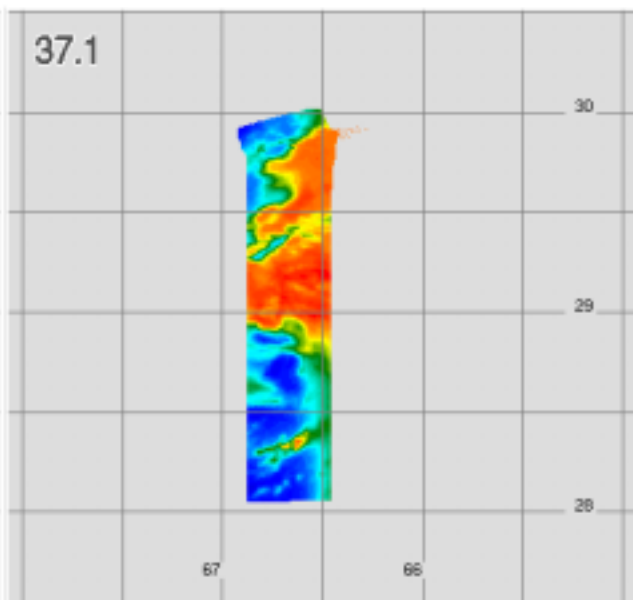
10.7



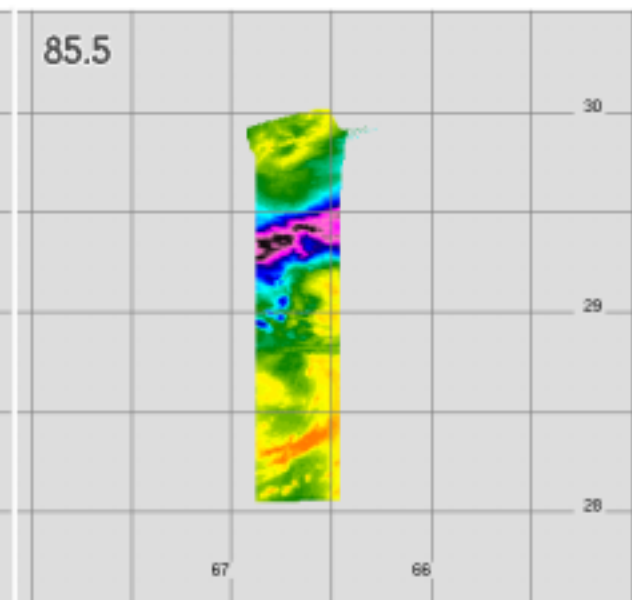
19.35



37.1

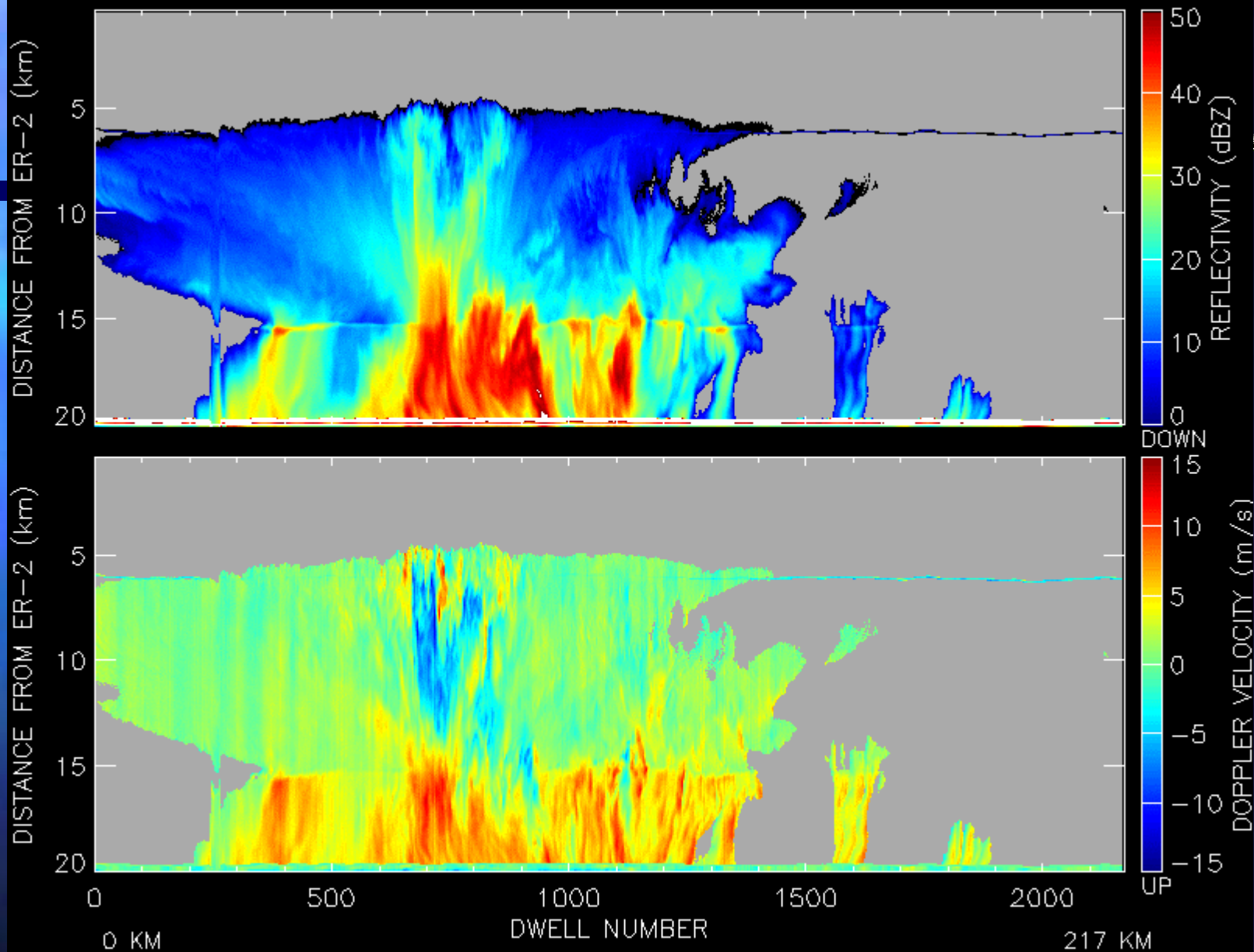


85.5

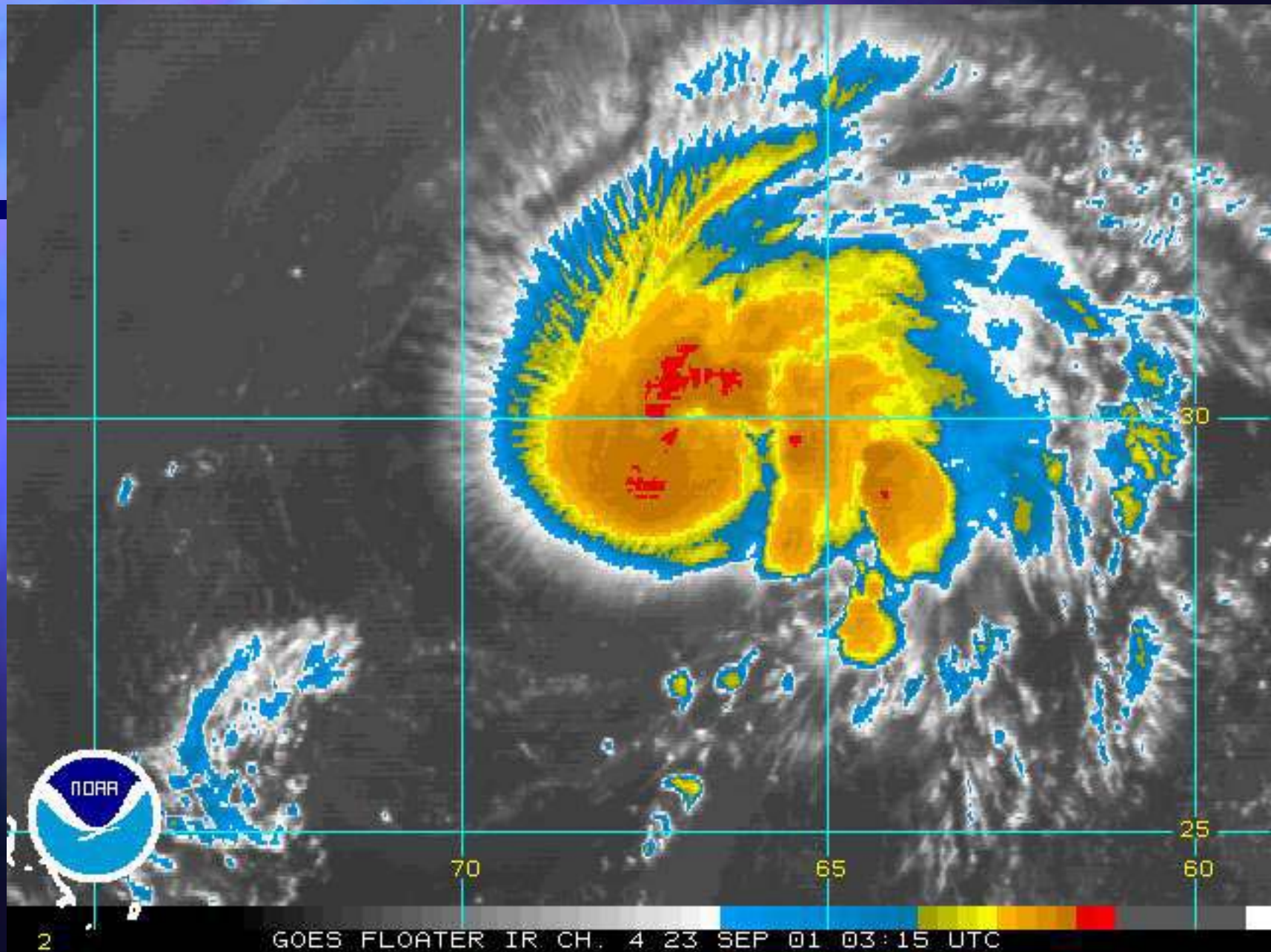


Preliminary data

EDOP 9-22-2001 19:29:46 -- 19:48:7 UTC NADIR



0 KM DWELL NUMBER 217 KM
camex4/bin/9-22-01/010922_1929-1948.bin_RAD1 Noise Removed



2

GOES FLOATER IR CH. 4 23 SEP 01 03:15 UTC

The Advanced Microwave Precipitation Radiometer (AMPR)

Image from CAMEX-4

23 Sep 2001 (266) 22:04:06-22:27:58 UTC

Frequencies in GHz

Cross-Track Scan (L-to-R in direction of motion)

$$V[\cos^2(\theta+45^\circ)] + H[\sin^2(\theta+45^\circ)] = 1$$

Grid Center: 32.50°N x 67.20°W

Grid Resolution: 0.83 km

NASA/NSSTC/GHCC

**** PRELIMINARY ****

Some data may have been interpolated

Elevation in Meters

0 500 1000



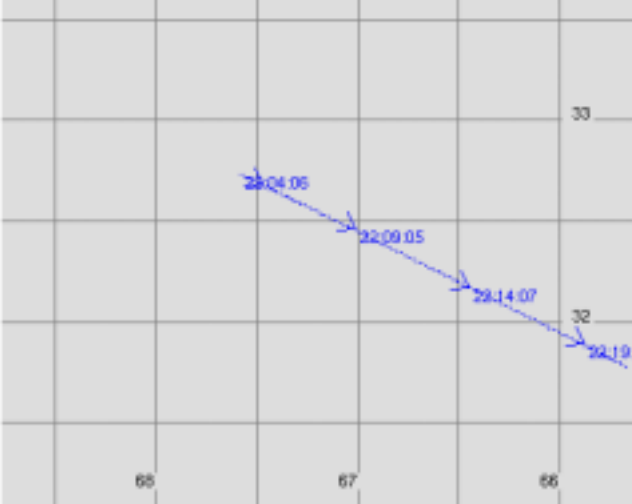
Source: United States Geological Survey Digital Elevation Model (DEM)

Brightness Temperature in Kelvin

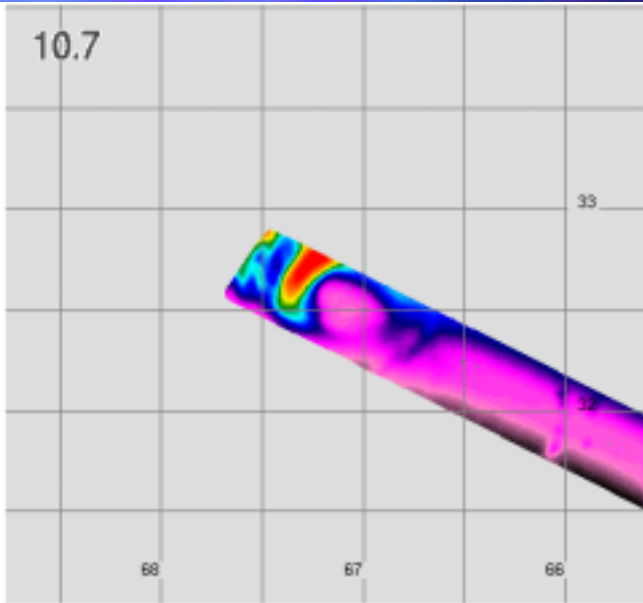


NASA ER-2 Flight Track

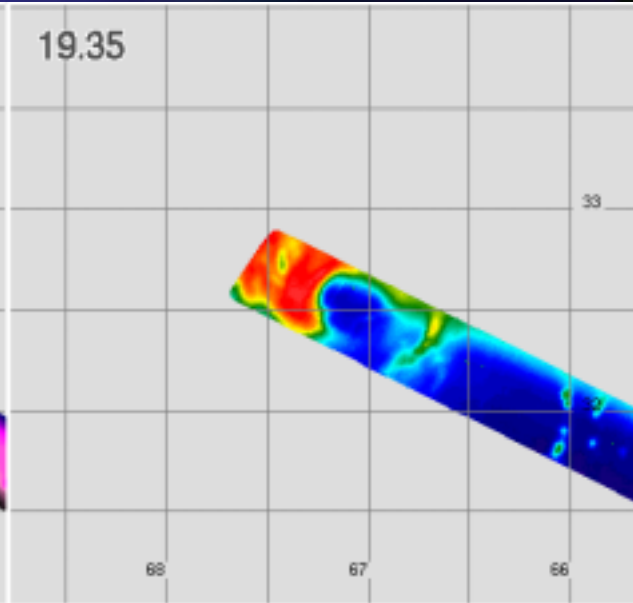
Mean Altitude: 20796 m



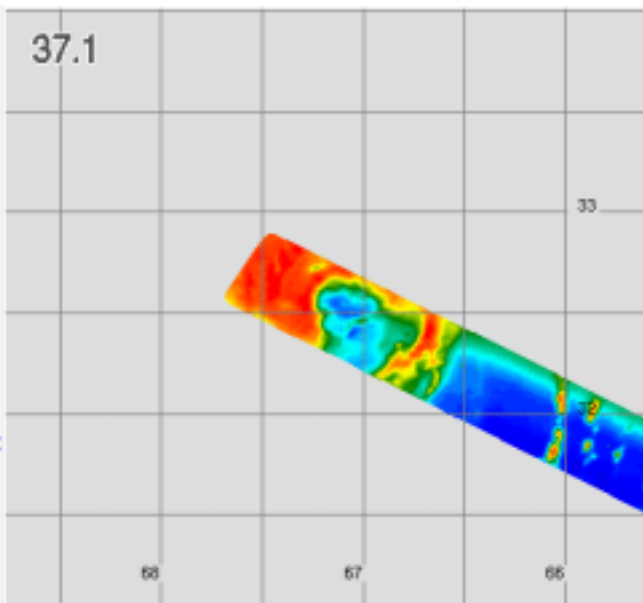
10.7



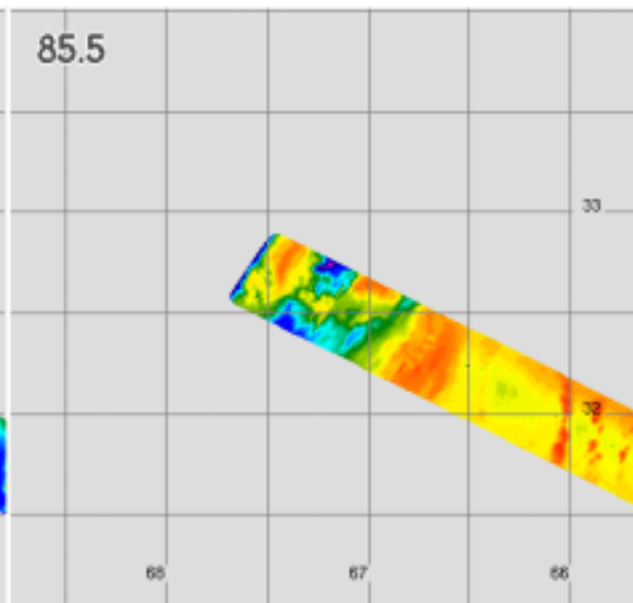
19.35



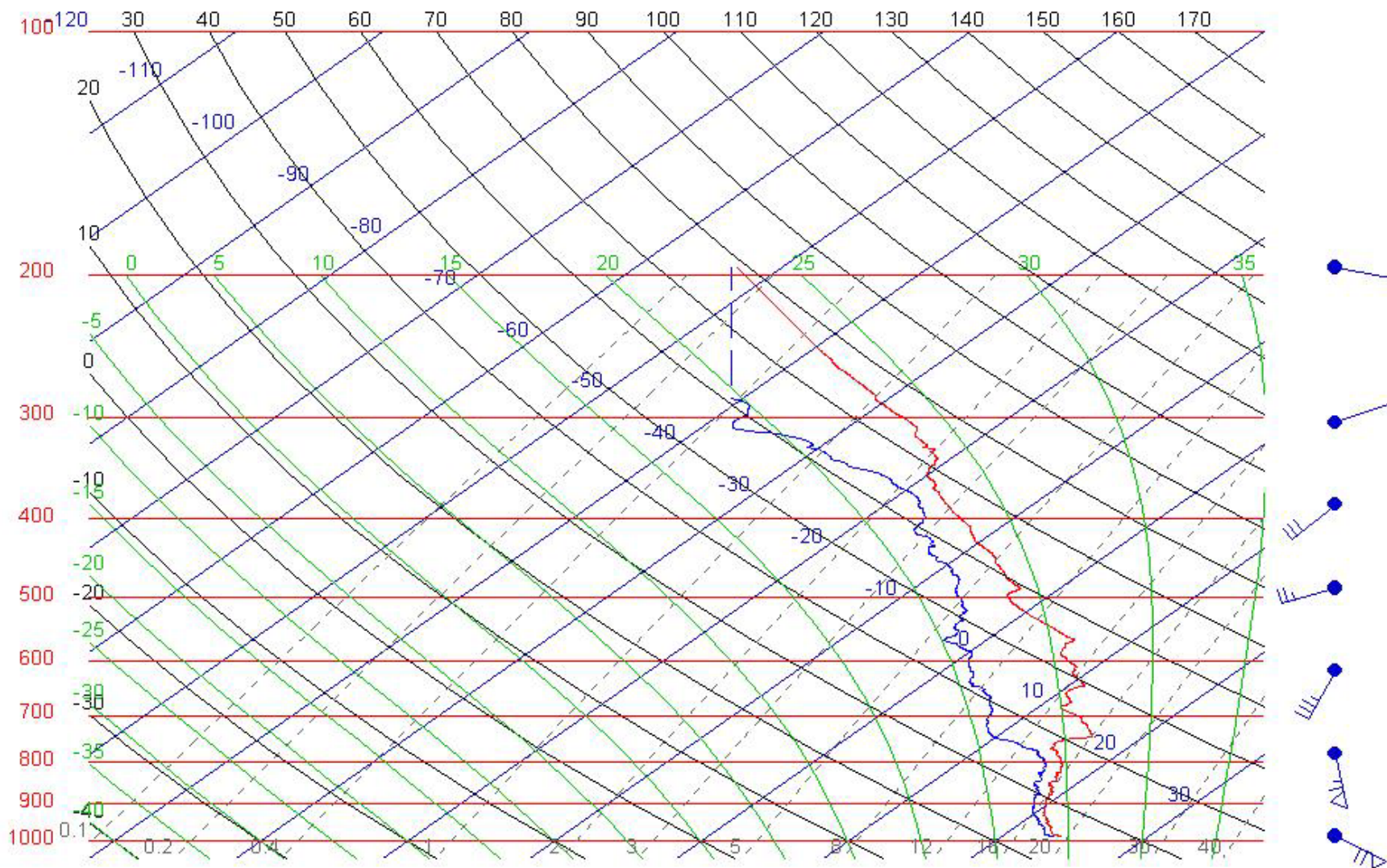
37.1



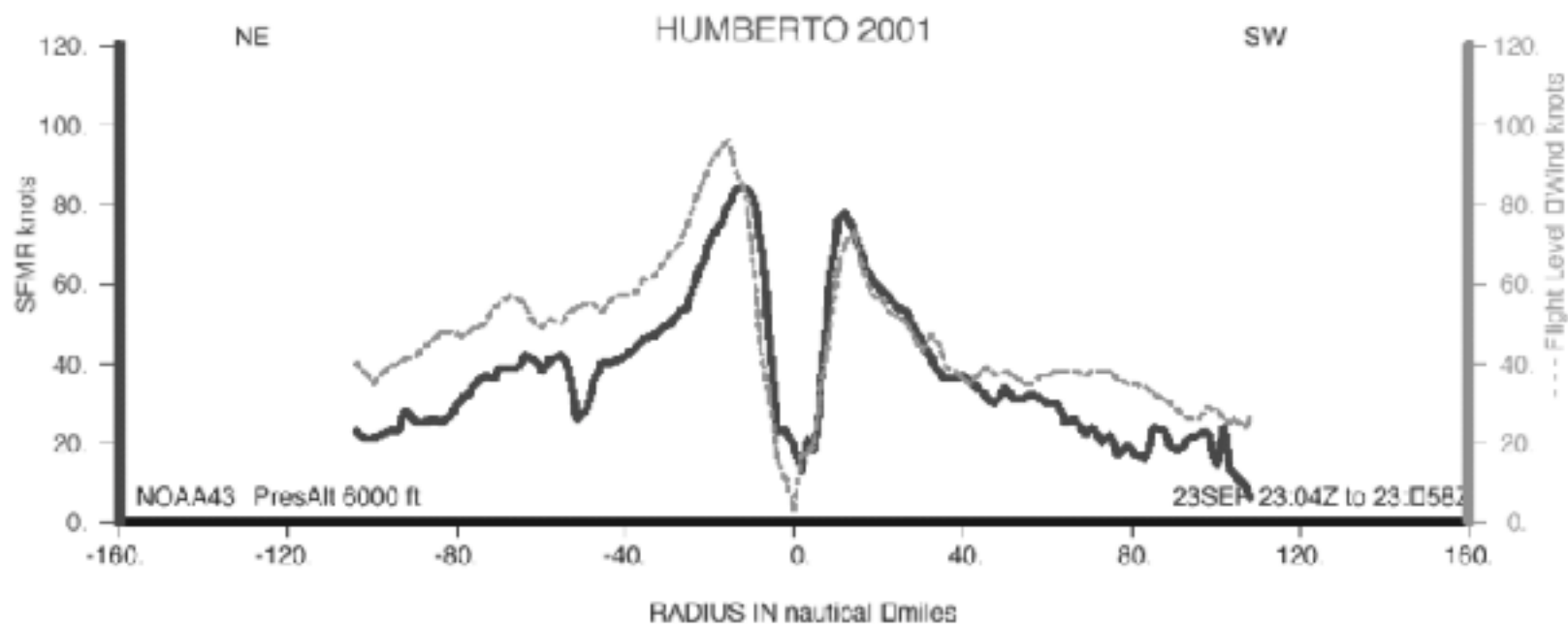
85.5



D20010923_234015.4 012625060 drop21 CAMEX 4, 010417 NASA DC-8,



Aspen V2.2.0, 24 Sep 2001 02:16 UTC



H₂O (g/kg)

0.05 0.50 5 20

