
D-CMET

1
00:00:04,400 --> 00:00:07,273
There's a general sense we need to know more

2
00:00:07,273 --> 00:00:09,408
about what's happening
above the Arctic Circle,

3
00:00:09,408 --> 00:00:12,879
and this is a region
that we have very few

4
00:00:12,879 --> 00:00:14,013
direct measurements.

5
00:00:14,013 --> 00:00:15,081
[Engine Sounds]

6
00:00:15,081 --> 00:00:19,118
>> Three, two, one, go.

7
00:00:19,118 --> 00:00:21,153
[Engine Sounds]

8
00:00:21,153 --> 00:00:23,956
Away.

9
00:00:23,956 --> 00:00:28,394
>> What we're doing
here has two objectives.rinh

10
00:00:28,394 --> 00:00:32,599
of Aeolus, which is a wind
measuring instrument from space.

11
00:00:32,599 --> 00:00:37,570
Our second objective is a
polar winds science mission

12

00:00:37,570 --> 00:00:42,375
where we're trying to validate
models that are designed

13
00:00:42,375 --> 00:00:45,711
to tell us what's happening
near the surface of the ice,

14
00:00:45,711 --> 00:00:49,649
of Greenland in particular.

15
00:00:49,649 --> 00:00:51,317
for today's [inaudible]
and the senior rep

16
00:00:51,317 --> 00:00:52,985
on deployment for the DC-8.

17
00:00:52,985 --> 00:00:56,022
[Engine Sounds]

18
00:00:56,022 --> 00:00:59,358
When you're chasing
things like winds,

19
00:00:59,358 --> 00:01:01,860
they're fairly dynamic
phobjectives will change,otn e

20
00:01:01,860 --> 00:01:05,364
or the area that they're wanting
to look has moved based off

21
00:01:05,364 --> 00:01:07,533
of what they're seeing,
and we have to try and make

22
00:01:07,533 --> 00:01:08,868
that happen real-time.

23
00:01:08,868 --> 00:01:10,503
That can be a challenge flying
in the airspace we're in,

24
00:01:10,503 --> 00:01:12,905
because in and around Greenland
it's a non-radar environment,

25
00:01:12,905 --> 00:01:15,941
which means that we're having

26
00:01:15,941 --> 00:01:19,512
[Voices over Radio]
over the radio.

27
00:01:19,512 --> 00:01:21,447
>> The DC-8's an excellent
scientific platform

28
00:01:21,447 --> 00:01:23,416
for a number of reasons.

29
00:01:23,416 --> 00:01:26,152
It's a four-engine
airplane, it's been re-engined

30
00:01:26,152 --> 00:01:29,889
with the CFM-56; it has plenty
of power to fly long distances;

31
00:01:29,889 --> 00:01:33,325
it's got a big wing that's
swept a little bit less

32
00:01:33,325 --> 00:01:34,994
than some of the airplanes;

33
00:01:34,994 --> 00:01:38,897
it's also extremely structurally

robust, so it's relatively easy

34
00:01:38,897 --> 00:01:40,733
to do structural modifications

35
00:01:40,733 --> 00:01:42,335
without affecting
the air worthiness.

36
00:01:42,335 --> 00:01:44,404
>> We're going to do
12,000 feet minimum altitude

37
00:01:44,404 --> 00:01:48,007
for the whole route
unless you cut these short.

38
00:01:48,007 --> 00:01:52,979
>> Okay.

39
00:01:52,979 --> 00:01:56,182
>> Because there's a 9200
foot peak right where the --

40
00:01:56,182 --> 00:01:59,118
ir

41
00:01:59,118 --> 00:02:02,655
that we've had four wind
lidars flying in formation.

42
00:02:02,655 --> 00:02:08,060
The DAWN lidar is a
Doppler aerosol wind lidar.

43
00:02:08,060 --> 00:02:11,797
What it does, it looks at the
small particles in the air,

44

00:02:11,797 --> 00:02:15,901
be it dust, ice, water droplets,

45
00:02:15,901 --> 00:02:18,371
what have you, to
measure the wind.

46
00:02:18,371 --> 00:02:23,176
And it uses infrared eye-safe
laser to measure those winds.

47
00:02:23,176 --> 00:02:26,312
>> TWiLiTE instrument is
a molecular Doppler lidar.

48
00:02:26,312 --> 00:02:30,683
Basically, it's a complimentary
instrument to the DAWN,

49
00:02:30,683 --> 00:02:35,054
which is an aerosol instrument,
and gets very high precision

50
00:02:35,054 --> 00:02:37,623
when there are aerosols
to scatter off of.

51
00:02:37,623 --> 00:02:41,760
TWiLiTE has less precision,
but a very predictable signal

52
00:02:41,760 --> 00:02:45,932
because it scatters directly
off the molecules themselves.

53
00:02:45,932 --> 00:02:47,700
>> Three, two, one, drop.

54
00:02:47,700 --> 00:02:54,140
>> -- and a dropsonde is a

small package of instrumentation

55
00:02:54,140 --> 00:02:55,642
that we drop out
of the aircraft.

56
00:02:55,642 --> 00:02:59,345
>> Two, one, go.

57
00:02:59,345 --> 00:03:02,014
>> So, we get wind speed,
wind direction, temperature,

58
00:03:02,014 --> 00:03:04,951
humidity, pressure, and
surface temperature.

59
00:03:04,951 --> 00:03:06,920
The lasers-- the
two lasers we have

60
00:03:06,920 --> 00:03:11,557
are telling us winds,
and aerosols, and clouds,

61
00:03:11,557 --> 00:03:14,694
but we need to know
the temperature for us

62
00:03:14,694 --> 00:03:18,064
to correct those observations
and adjust those observations.

63
00:03:18,064 --> 00:03:21,401
>> So, we have a lot of opinions
on what's happening out there,

64
00:03:21,401 --> 00:03:25,104
and our job here, at least my
mission, is to take measurements

65
00:03:25,104 --> 00:03:26,739
where we can go back

66
00:03:26,739 --> 00:03:29,375
and validate those
models and improve them.

67
00:03:29,375 --> 00:03:31,778
But this is a great
opportunity for us