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1
00:00:01,330 --> 00:00:03,300
Every one of the instruments on here

2
00:00:03,320 --> 00:00:06,320
has had to be spec'd to work

3
00:00:06,340 --> 00:00:08,540
at phenomenal levels.

4
00:00:08,560 --> 00:00:11,210
So we're going to be flying in the background atmosphere.

5
00:00:11,230 --> 00:00:13,450
That usually means there's very little

6
00:00:13,470 --> 00:00:15,450
of whatever you're trying to measure.

7
00:00:15,470 --> 00:00:16,980
For something like CO2

8
00:00:17,000 --> 00:00:18,450
we need such high sensitivity -

9
00:00:18,470 --> 00:00:20,630
there's lots of CO2 there,

10
00:00:20,650 --> 00:00:23,690
so every tiny change in it makes a difference.

11
00:00:23,710 --> 00:00:25,220
For something like ozone,

12
00:00:25,240 --> 00:00:27,470
we're going to be looking at very small numbers

13
00:00:27,490 --> 00:00:29,000

in the background atmosphere.

14
00:00:29,020 --> 00:00:32,000
For something like NOx, NO and NO2,

15
00:00:32,020 --> 00:00:34,810
the numbers are the lowest, even today,

16
00:00:34,830 --> 00:00:36,810
the lowest that instrument has ever measured

17
00:00:36,830 --> 00:00:38,490
was earlier on in the flight today.

18
00:00:38,510 --> 00:00:41,470
So the instrument is a cavity enhanced system,

19
00:00:41,490 --> 00:00:43,370
so we take light from the laser

20
00:00:43,390 --> 00:00:45,570
and put it through a sampling cell.

21
00:00:45,590 --> 00:00:48,850
And then we look and see how much light disappears

22
00:00:48,870 --> 00:00:50,590
when we have a certain amount

23
00:00:50,610 --> 00:00:53,380
of any of the four gases that we measure.

24
00:00:53,400 --> 00:00:55,250
For a given amount of CO2

25
00:00:55,270 --> 00:00:56,720
that's in the atmosphere,

26
00:00:56,740 --> 00:00:58,380
a certain amount will be absorbed

27
00:00:58,400 --> 00:00:59,620
of the laser light

28
00:00:59,640 --> 00:01:01,130
and then we can tell from that

29
00:01:01,150 --> 00:01:02,990
how much CO2 there is.

30
00:01:03,010 --> 00:01:05,630
We do a lot of profiles over TCCON sites,

31
00:01:05,650 --> 00:01:08,440
which are sites that look up at the sun

32
00:01:08,460 --> 00:01:11,780
and give us a total column of CO2 and methane

33
00:01:11,800 --> 00:01:14,540
between that site and the sun.

34
00:01:14,560 --> 00:01:18,040
But we also fly underneath some of the satellites.

35
00:01:18,060 --> 00:01:20,320
So today we've been doing an underpass

36
00:01:20,340 --> 00:01:22,580
under the OCO-2 satellite,

37
00:01:22,600 --> 00:01:25,460
where they measure CO2 columns.

38
00:01:25,480 --> 00:01:27,630

So we'll be sending all of the CO2 profiles

39
00:01:27,650 --> 00:01:28,900
that we measure

40
00:01:28,920 --> 00:01:31,170
to the OCO2 team

41
00:01:31,190 --> 00:01:33,880
to help with the validation of their instrument.

42
00:01:33,900 --> 00:01:35,930
A project like ATom

43
00:01:35,950 --> 00:01:38,580
is ideally suited for that,

44
00:01:38,600 --> 00:01:40,830
so it just takes a little extra coordination

45
00:01:40,850 --> 00:01:43,110
to try and get the most out of that.

46
00:01:43,130 --> 00:01:44,340
Looking at the real time data

47
00:01:44,360 --> 00:01:46,030
does give us ideas about

48
00:01:46,050 --> 00:01:47,780
what we should be interested in

49
00:01:47,800 --> 00:01:49,480
when it comes to looking at the data.

50
00:01:49,500 --> 00:01:51,680
Because there is a huge amount of data

51
00:01:51,700 --> 00:01:54,350
that's going to be produced from ATom,

52
00:01:54,370 --> 00:01:56,310
so I think there'll be a lot

53
00:01:56,330 --> 00:01:58,370
of the wider science community

54
00:01:58,390 --> 00:02:00,210
who end up using this data set,

55
00:02:00,230 --> 00:02:02,230
and I can see it being invaluable

56
00:02:02,250 --> 00:02:05,230
to all the modeling community.

57
00:02:05,250 --> 00:02:06,440
From what I've heard from them,