



1

00:00:00,099 --> 00:00:02,820

>>This represents twenty-two strain gauges.

2

00:00:02,820 --> 00:00:07,490

And each one of these connectors represents one measurement, or one single-point measurement

3

00:00:07,490 --> 00:00:10,190

along the length of this simulated wing.

4

00:00:10,190 --> 00:00:15,970

While the second technology that we're featuring on this simulated wing is based on fiber-optics.

5

00:00:15,970 --> 00:00:21,040

This is a single fiber-optic cable, so this particular connector right here, represents

6

00:00:21,040 --> 00:00:25,330

on this particular installation, three-hundred and twenty-one measurements.

7

00:00:25,330 --> 00:00:29,660

That's a measurement every quarter inch along the length of this panel and back towards

8

00:00:29,660 --> 00:00:30,660

the root.

9

00:00:30,660 --> 00:00:35,929

So the difference is, you can see, that twenty-two sensors, three-hundred and twenty-one sensors.

10

00:00:35,929 --> 00:00:40,120

And you can see the weight difference and the size difference and the bulkiness between

11

00:00:40,120 --> 00:00:42,440

the two technologies.

12
00:00:44,589 --> 00:00:49,339
And just to give you a little demonstration,
we have data flowing on the computer here

13
00:00:49,339 --> 00:00:55,230
that's gonna show not just the strain information
along the length of this panel, but as well

14
00:00:55,230 --> 00:01:00,800
as the shape-rendering of this panel based
upon the strain content that we're getting

15
00:01:00,800 --> 00:01:03,489
from the fiber-optic sensors.

16
00:01:03,489 --> 00:01:09,140
Here we're just doing a simple bending that
simulates aerodynamic loading in the downward

17
00:01:09,140 --> 00:01:12,439
direction, here's in the upward direction.

18
00:01:12,439 --> 00:01:18,670
I'm gonna simulate what we call twist, you
can see that on the top left graph.

19
00:01:18,670 --> 00:01:21,950
This is twist in the opposite direction.

20
00:01:21,950 --> 00:01:25,649
And also we'll introduce a second mode here
in the middle of the panel and you should be

21
00:01:25,649 --> 00:01:28,990
able to see that as well.

22
00:01:28,990 --> 00:01:31,100
So there you have it.

23
00:01:31,100 --> 00:01:37,660
Fiber-optic sensing installed on a simulated wing showing both strain and shape information.

24
00:01:37,670 --> 00:01:44,100
>>So the next step for the fiber-optic sensing system technology here is gonna be to design

25
00:01:44,109 --> 00:01:49,969
a ruggedized system that will be able to survive space application, so a rocket launch.

26
00:01:49,969 --> 00:01:54,880
We've done applications before with airplanes within Earth's atmosphere, but the next step

27
00:01:54,880 --> 00:01:57,729
is gonna be space application here.

28
00:01:57,729 --> 00:02:01,490
So what you see here is the actual avionics system, the actual electronics of the FOSS

29
00:02:01,490 --> 00:02:06,180
system, so the next step is gonna be putting it into the ruggedized enclosure that has

30
00:02:06,180 --> 00:02:11,260
been specifically designed and tested to survive a space application, a rocket launch.

31
00:02:11,260 --> 00:02:16,720
It's been ruggedized so the next step here is gonna be to install the actual avionics

32
00:02:16,720 --> 00:02:22,050
systems, the actual electronics of the FOSS system into the ruggedized enclosure here.

33

00:02:22,050 --> 00:02:25,280

After we've finished the full integration
of these systems and we torque everything

34

00:02:25,280 --> 00:02:29,760

down to spec, then we'll ship them off to
Langley, the NASA center which is gonna be