

We Brake for Mars: Part 2

Hi! This is Mike Meacham again at the Jet Propulsion Laboratory and I want to talk to you some more about some other inflatable technologies we're working on to slow down bigger and heavier things on Mars.

(music)

When we're coming into Mars, we're going over 10,000 miles per hour, several times faster than the speed of sound, and we have to wait until we're only going twice the speed of sound before we can deploy our parachute.

So we wanted to work on some other device that we could inflate when we're going even faster than that, so we can pull the E brake when we're coming in.

(music)

This other device we call the SIAD, Supersonic Inflatable Aerodynamic Decelerator, SIAD.

We are able to inflate this around our heat shield and increase our drag area by sometimes even twice as much as it normally would be.

So we saw that crazy test with the parachute before, right?

That's in order for us to load up our parachute to the same types of forces it's going to feel on Mars. We wanted to do the same thing with the SIAD.

So we went back to the same track. We had to make a whole new rocket sled.

It's a huge one. It's bigger than a house. It weighs 50,000 lbs.

So we strap a bunch of rockets to this huge sled. We drive this down the track going about 250 miles per hour and inflate the SIAD and we study all the different things that are going to happen to it under this same aerodynamic load.

The atmosphere on Mars is a whole lot thinner than the atmosphere we have here on Earth. There's really only one place you can go to test your devices in a relevant environment and that's way up in the sky here -- the upper atmosphere.

Pretty soon we're going to go out to Hawaii to a facility that they have there.

We're going to take a balloon that's literally the size of a whole football stadium.

It's going to pick up our test vehicle. It's going to go up about 120,000 feet into the upper atmosphere.

Our test vehicle is going to drop off the balloon. It's going to spin up like a football for stability. Shoot sideways across the sky with a huge rocket.

Our rocket is going to bring it up to four times the speed of sound, where we can test our SIAD and our parachute in the same exact type of environment that they're going to see on Mars.

As crazy as these tests sound, they actually performed them over 40 years ago and we've been using that technology since then to land rovers on Mars.

But it's time to go bigger. We want to land astronauts and bigger payloads on Mars.

So we want to see just how far we can push this technology.