



# VIBRATION ISOLATION SYSTEM REDUCES LAUNCH-SHOCK FOR SMALL SENSITIVE SATELLITE PAYLOADS

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## Payoff

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Similar to the shock absorbers on a car, the whole-spacecraft isolation system reduces launch vibrations by a factor of 3 to 5. It will allow the Space-Based Infrared Systems (SBIRs) - Low program and the space test program to safely fly multiple payloads on spacecraft, saving millions of dollars in life-cycle costs.

## Accomplishment

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The Space Vehicles Directorate's (VS's) Soft Ride for Small Satellites vibration isolation team, in partnership with CSA Engineering, designed, built, and flew the world's first whole-spacecraft isolation system on a Taurus launch vehicle. The system cushioned the Navy's Geosat Follow-On (GFO) spacecraft used to measure sea levels. Due to this successful flight, other organizations such as Orbital Sciences Corporation, Lockheed-Martin, Boeing, and the Air Force Small Launch Vehicle office are interested in this pioneering technology.

## Background

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In the last decade, billions of dollars were lost because of payloads damaged by launch-shock vibration. Vibration isolation technology, developed by VS can save programs millions of dollars per spacecraft by now enabling the use of commercial hardware that otherwise could not endure the launch stress. Cost reductions for programs that have used or will use this technology are significant. Payload specialists calculated that the whole-spacecraft isolation technology saved the GFO program 6 to 9 months and 3 to 5 million dollars. The National Reconnaissance Office, estimates this technology saved their program 9 to 12 months and 4 to 6 million dollars in redesign time and costs. Lockheed-Martin expects the device will save the SBIR-Low program several million dollars just in an ability to buy commercial-off-the-shelf equipment that would not normally survive launch vibrations.