Satellite propulsion firm Busek Co. Inc. confirmed the launch of the world’s first flight-qualified electrospray thrusters on LISA Pathfinder. The micro-newton colloid-style electric thrusters were developed by Busek under contract with NASA’s Jet Propulsion Laboratory (NASA ST-7 Program).

The precision electrospray thrusters are part of NASA’s Disturbance Reduction System (DRS) which serves a critical role for LISA Pathfinder’s science mission. “Busek, with our partners at NASA, developed the micro-newton electrospray propulsion system on LISA Pathfinder from the drawing board to flight qualification…it was challenging yet deeply rewarding work.” said Vlad Hruby, Principal Investigator of the ST-7 thrusters and President of Busek. “The effort laid the foundation and deep fundamental understanding for Busek’s Cubesat and SmallSat electrospray thrusters including our 100 micro-Newton BET 100uN, the one milli-Newton BET-1mN, as well as the high power electrospray thrusters we have in development,” added Hruby. LISA Pathfinder’s DRS will be activated upon the spacecraft’s arrival at Lagrange Point 1, some 1.5 million kilometers from earth.

The high precision thruster system is designed to keep the spacecraft flying centered around a gold and platinum mass which floats freely inside the spacecraft. The mission and spacecraft design is an effort to detect the gravitational waves predicted by Albert Einstein’s Theory of General Relativity, which was published in 1915.
Satellite propulsion firm Busek Co. confirmed commissioning of the firm’s electrospray thrusters aboard the LISA Pathfinder spacecraft. All eight of the electric propulsion devices on board the spacecraft successfully test fired along the satellite’s journey to Lagrange Point 1, a destination some 1.5 million kilometers (0.9 million miles) from earth.

The electric propulsion systems are the first of their kind to be operational in space and provide the precision control necessary for the spacecraft’s science mission. The novel electric propulsion system was developed by Busek under contract with NASA’s Jet Propulsion Laboratory (JPL), and are part of JPL’s Disturbance Reduction System (DRS). “We’re elated to report that the DRS has successfully passed our first on-orbit commissioning with all thrusters passing their functional tests. The Busek thrusters are performing well and we look forward to our operational experiments later this summer,” said Phil Barela, Project Manager for the Space Technology-7 Program at JPL.

“Today’s in-space commissioning is an enormous milestone for all of us at Busek, our partners at NASA JPL, and our friends at ESA.” said Vlad Hruby, Principal Investigator of LISA Pathfinder’s electrospray thrusters and President of Busek. “The fully fueled thrusters were delivered eight years ago…their operation after this long dormant period is both a relief and a testament to our technology and approach. I’m proud of the team’s work on LISA Pathfinder, and excited about the higher power electrospray systems Busek is building for CubeSats, and small satellites,” added Hruby.

The electrospray thruster technology has direct applications in spacecraft formation flying, laser communications, and CubeSat propulsion.