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BREAKING NEW GROUNDS AND RECORDS: NEW METHODOLOGIES AND PRACTICAL APPLICATIONS IN THE CONVERGENCE OF AEROSPIKE MOTORS AND OCEANIC LAUNCH VEHICLES

Abstract

Recent advances in aerospike engine development have opened new avenues to Low Earth Orbit. During the spring and summer of 2017 a small team of multinational researchers have designed, developed and flew the world's first aerospike motor to successfully breach the karman line, as well as the first sea launched vehicle to accomplish the same goal. Over the course of two suborbital flights and several lower altitude test flights and static fires, the team has proven that with the convergence of materials engineering and advanced nozzle design, there is a reliable path to orbit for new classes of vehicles able to achieve orbital velocities without the need for expendable launch hardware.

Sea launching rockets are capable of being used anywhere in the world as the infrastructure it launches with or from is mobile and the vehicle is not confined to a launchpad. Aerospike Engine Technology has been revered to be the holy grail of rocket technology with the potential of making launch vehicles single-stage to orbit or SSTO. Their ability to provide altitude compensation, better efficiency in propellant/ oxidizer consumption are just a few features of what the aerospikes can accomplish.

Ripple Aerospace AS, a Norwegian aerospace company, received grants from the Norwegian government in the winter of 2016 to research and develop a prototype oceanic rocket combining a ballast system that stabilizes the rocket on the open ocean and to develop aerospike engines required whose sub orbital testing is applicable into an orbital launch vehicle. Operations for development of both the rocket and the ballast system commenced in December of 2016 with physical construction in February 2017.