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A COMPETITIVE WAY TO ACCESS MICROGRAVITY: SUBORBITAL SPACE

Abstract

We are about to experience a major shift in suborbital space access driven by new entrepreneurial ventures that are developing suborbital commercial systems to serve both existing and new markets. These new ventures are focusing their efforts on suborbital reusable launch vehicles (sRLV) capable of crossing the threshold of space (100km) and offering around one to four minutes of microgravity. A broad range of sRLV ventures are underway: some are still in the design phase, others are in their final testing phase, while a few are already operational. Their first revenue earning flights will carry science and engineering payloads and some will later fly space tourists.

An overview of the current suborbital and microgravity capabilities will be given and then compared to the sRLV systems, which vary between vertical takeoff/landing rockets and horizontally launched winged vehicles. Though more technically challenging than expendables, reusable vehicles amortize their production costs over a larger number of flights and thereby reduce their per flight unit cost. They will also fly more frequently and achieve much higher levels of reliability and safety than expendable vehicles and so offer a more flexible, efficient, inexpensive, frequent access to space for payloads and spaceflight participants.

A new spaceflight industry is growing to exploit high flight rates and relatively low cost markets. Research areas such as biology, physics, advanced materials and Earth science can benefit from suborbital space access, while commercial companies can boost their research and development sectors (e.g. pharmaceutical business).

Telespazio VEGA has been actively promoting this rapidly emerging market of commercial suborbital spaceflight and has taken initial steps to connect this growing market with first flight opportunities. As most of these ventures are based in the USA, these steps are also enabling Non-US researchers to take maximum advantage of this new, competitive way to exploit microgravity.