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WHERE ARE ALL THE SMALL SATELLITE LAUNCH VEHICLES?

Abstract

Smallsats are becoming a booming market. The miniaturization of electronics, together with reliability and performance increase and reduction of cost, have allowed the use of commercials-off-the-shelf (COTS) in the space industry, fostering the Smallsat use. Briefly, the (r)evolution of the Smallsats is analyzed and the corresponding market potential for small satellite launch vehicles outlined. An analysis of current and future launch vehicles reveals that we are currently in a phase of transition, where old launch vehicles get retired and new ones enter the market. However, the satellite launch vehicle business has been established to carry payloads of thousands of kilos into orbit, and has not adjusted itself to the market of Smallsats. Usually, Smallsats fly as secondary payload, so called piggyback. In the past, the use of converted Intercontinental Ballistic Missiles enabled cheap access to space through the rideshare concept. Until its end-of-life, the International Space Station is an important platform for orbital injection of Smallsats. However, the only way to define orbit and launch date, important requirements for commercial Earth observation and communication satellites, is via dedicated launches. Several initiatives around the world developing small launch vehicles are identified and analyzed, but it is uncertain if they will succeed as a viable commercial option, since most of their announced price tags seem unrealistic. Satellite launch vehicles, regardless of their sizes, have similar complexity and are inherently costly. Unless substantial government funds are provided for Infrastructure; Development; Qualification Flights; and Range and Ground Operations, or some disruptive propulsion technology comes into place, their final launch cost will limit their competitiveness.