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THE CHANGING LAUNCHER LANDSCAPE – A REVIEW OF THE LAUNCH MARKET FOR SMALL SATELLITES

Abstract

Small satellites have traditionally been launched as piggyback or as secondary passenger on existing launch vehicles with excess capacity. Emerging commercial interest through "newspace" ventures in utilising small satellites in a range of applications has focused attention on the launch market for small satellites in recent years. The lack of flexibility in traditional manifesting of small satellites on existing launchers is often not compatible with their commercial objectives in terms of launch schedule and orbit selection. In particular many of the new initiatives plan to use large groups and constellations of satellites, and in some cases mega-constellations, and launch capacity in terms of available opportunities is generally considered insufficient.

The increasing demand for launch capacity from small satellites has led to mechanisms such as cluster launches and shared launches, which aggregate multiple small satellites onto existing launch vehicles. Standardisation has also helped increase the number of opportunities across different launches, e.g. through the establishment of Cubesat deployer systems which can be manifested on a wide range of different launch vehicles. However the options for launch of most other types of small satellite remain limited, and subject to politics, export controls, limited flights per year, and lack of true market forces driving the launch providers.

Consequently, as the investment and number of proposed small satellite constellations has increased, a number of new launch vehicle initiatives have been created to specifically serve this "newspace" launch demand. In some cases these launchers are based on earlier initiatives into space tourism, and in other cases they are specifically targeted at launching individual or small batches of single small satellites.

This paper reviews the launch market from the perspective of small satellite customers, and provides insights into the choices that users will need to make when selecting their launch vehicle in the coming years.