

Micro-Satellite as an Alternative Vehicle

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Advantages of 50-100kg class micro-satellite would be a key for future space development dedicated to monitoring of solar activity and climate change. Its characteristics and merits compared to larger sized satellite are: 1) low cost fabrication: It takes few M USD, including BUS and mission payloads. The launch cost will be about 2 M USD as piggyback, 2) quick fabrication: about one or two years for flight model would be sufficient, enabling application of the latest technologies, 3) on-demand operation, taking detail information at a point of interest, and 4) the low cost and quick fabrication make us possible to launch not a small number of satellites and operate them as a network, which is called as constellation flight. The performance of micro-satellite is rapidly being improved. For example, our group can provide 50-60 kg micro-satellite with specifications listed below: The pointing error is well less than 0.1 degree and the attitude stability is better than 1.5 arcsec / 0.01 sec. Max power is 50 W and the telemetry rate is an order of M bps or faster. Possible weight for science payload is 15kg or larger. The expected life time is 5 years or more. We can install a telescope with an aperture of 100 mm and a focal length of 1000 mm (1.5 arcsec/pixel). Its longest dimension and weight is 40 cm and 3kg, respectively. This kind of micro-satellite and advanced optics enable us to monitor solar activity continuously.