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mart remote-sensing by super constellation with micro-satellites

Yukihiro Takahashi[1*]

[1]Space Mission Center, Hokkaido University

Micro-satellite with a weight of 50-100 kg has various merits compared to middle and large sized satellite, that is, 1) low cost fabrication compared to middle or large sized satellite, namely, few M EUR including BUS and mission payloads. The launch cost will be 1-2 M EUR 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, which is called as constellation flight.

The constellation realizes a frequent monitoring from the low earth orbit. If we inserted 48 satellites into proper orbits, we can watch any location in the world every 7-8 min, which could be dedicated efficiently to time-variable phenomena, such as flood, thunderstorm, forest fire and Tsunami. Another important aspect of micro-satellite is the advanced technology of payload sensors. LCTF (liquid crystal tunable filter) enables the super multi-color imaging at several hundreds of wavelengths without image distortion due to the unstable attitude of spacecraft. Bolometer array sensor make it possible to take image in mid-infrared band range around 10 um without cooling system, meaning light weight and less power consumption.

We would suggest the establishment of the Smart Remote-Sensing with super micro-satellite constellation, making use of advanced sensors, under collaboration among Asian countries in the near future.

Keywords: smart remote-sensing, super constellation, micro-satellite