

Development of the Small Satellite Constellation for Greenhouse Gas Detection

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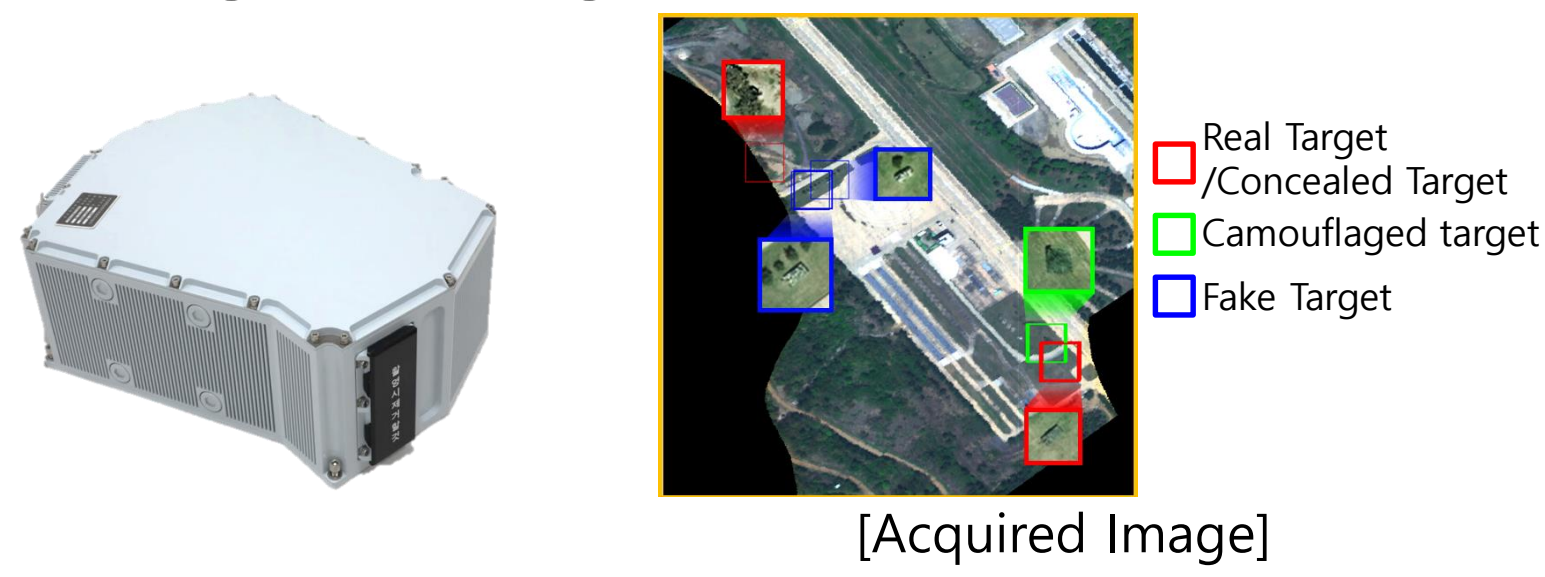
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Abstract

- To minimize the impact of the greenhouse gas effectively to the global boiling era, it is crucial to detect the greenhouse gas emission source and its emission rate.
- Hanwha System is developing the small satellite constellation for methane detection as a satellite program initiated from NIER.

HSC's Capability of Hyperspectral Remote Sensing

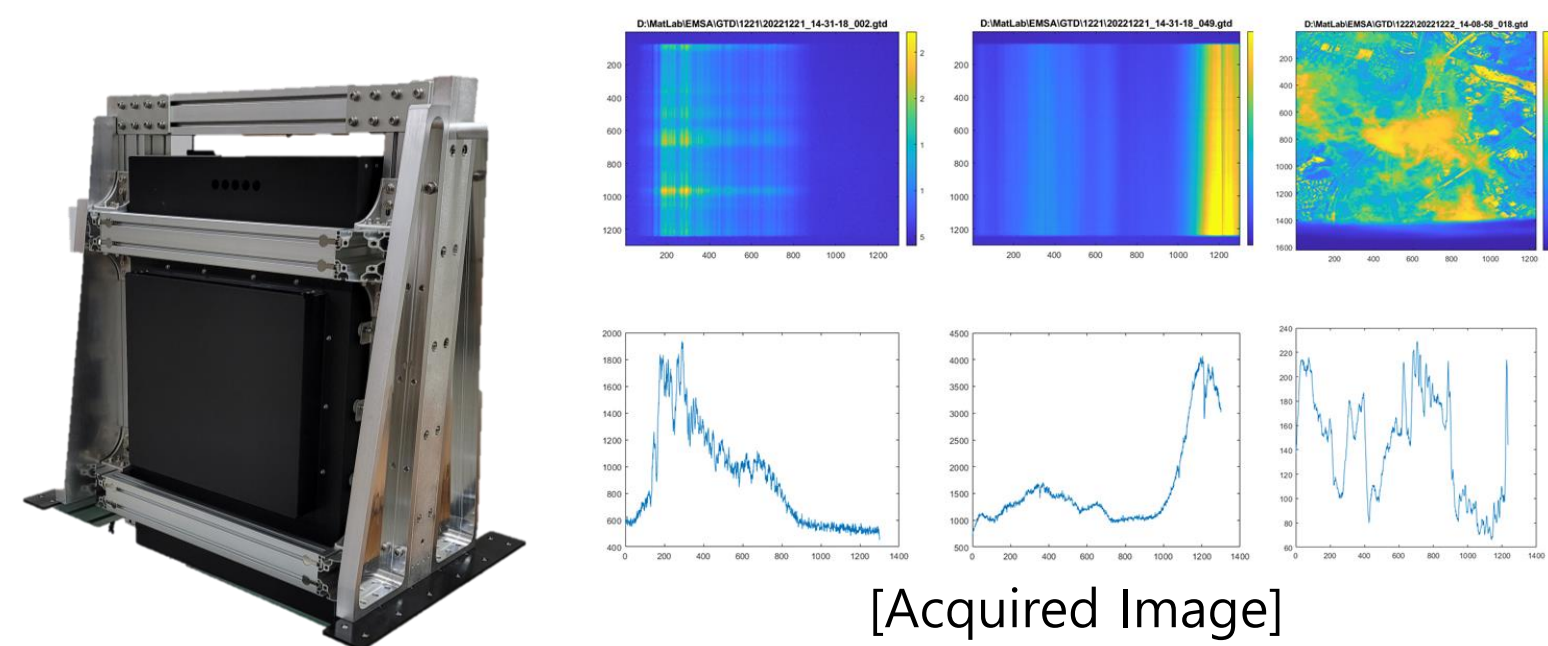
Airborne Hyperspectral Imager for Target Recognition



- Korea-first hyperspectral Imager
- VNIR: 400-900 nm, SWIR: 900-1700 nm
- TMA fore optics
- Offner spectrometer with Grating

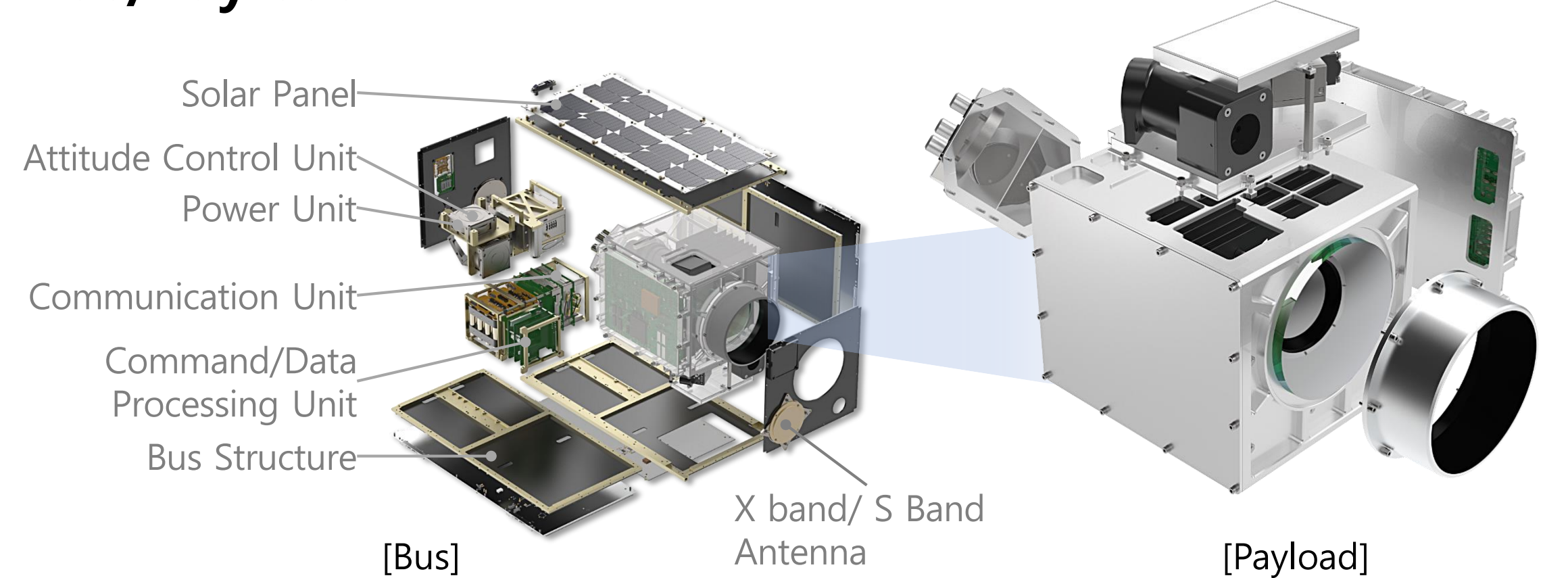
	VNIR	SWIR
MTF	0.31	0.21
Keystone [Pixel]	0.05	0.17
Smile [Pixel]	0.11	0.26
Spectral Resolution [nm]	3.94	6.58

EMSA – Environment Monitoring Spectrometer for Aircraft Platform



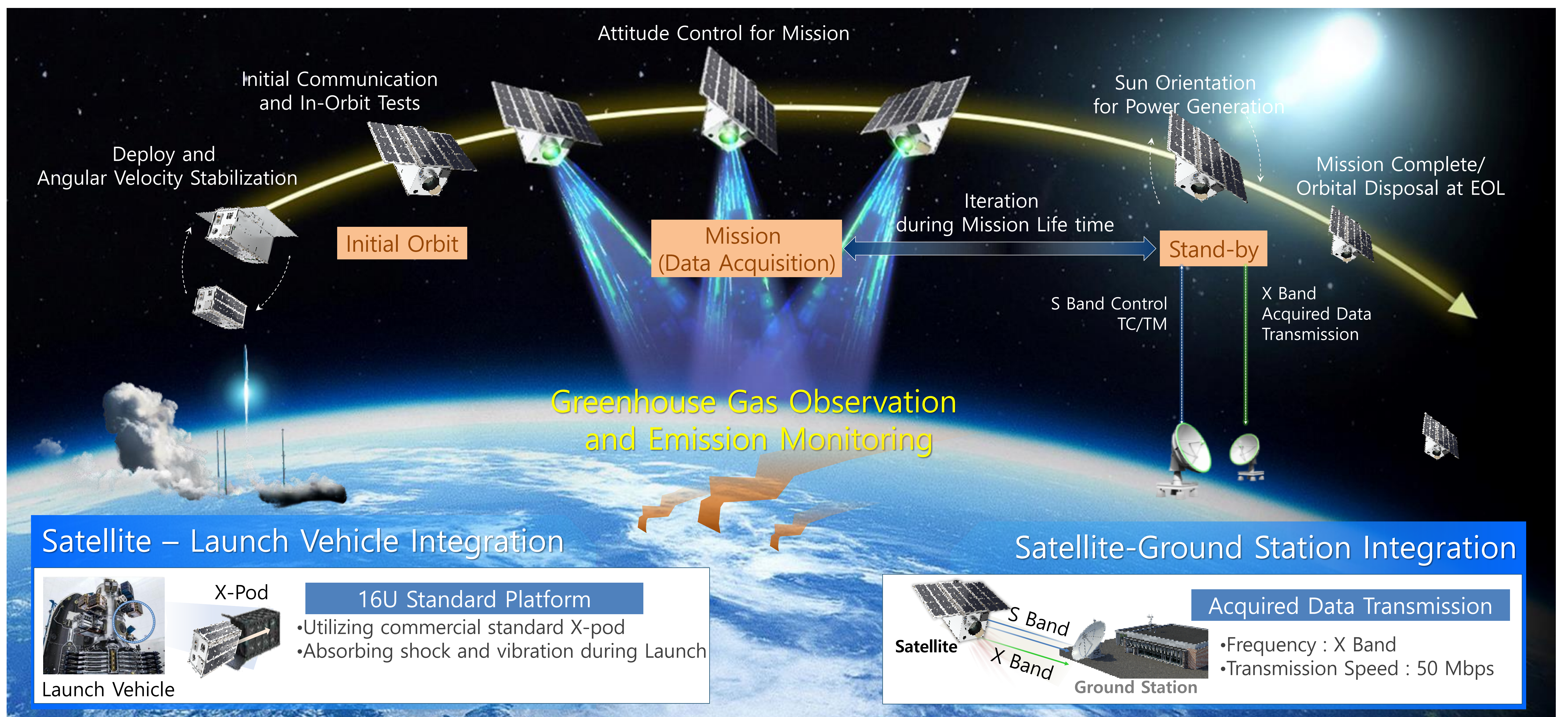
- Airborne Hyperspectral Imager for Air Pollution Monitoring
- Korean Version of GeoTASO (GEMS)
- UV: 290nm-415 nm, VIS: 415-695 nm
- TMA fore optics
- Offner relay spectrometer with Grating

Greenhouse Gas Monitoring Satellite Bus/Payload



- Korea-first Methane detection small satellite constellation
- SWIR channel Hyperspectral Imager
- GSD~100 m, Spectral Resolution 0.1nm(TBD)
- In-house development of 16U Satellite including bus and payload

Operation Concept



Conclusion

- Hanwha Systems(HSC), a leading company of Korea in the space industry, has been developing several remote sensing hyperspectral imagers, and will develop small satellite constellation for greenhouse gas detection.
- The 1st FM will be launched in 2027 and rest of the FMs will be launched in 2028 to form a constellation of greenhouse gas monitoring small satellites.

Acknowledgement

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