

IAF EARTH OBSERVATION SYMPOSIUM (B1)  
Future Earth Observation Systems (2)

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## ADDING A FURTHER DIMENSION TO SMALL SATELLITE EO CONSTELLATIONS

**Abstract**

In the past year, the NovaSAR radar smallsat and the S1-4 high resolution smallsat have been coordinated in close proximity on-orbit, observing targets of interest with different sensors. Satellite constellations have traditionally been homogeneous, using duplicates of the same satellites to provide the highest possible temporal resolution. A constellation of satellites with different sensors can provide an additional dimension to services and data analytics. It makes it possible to use the information from one satellite, in order to provide key tasking information for another satellite. In-orbit rearrangement of satellites can create a range of systems that can be configured on-demand to address a range of new applications.

Small satellites and sensor capability have only recently advanced far enough to make such a systems financially viable. Key challenges in such systems are optimising the composition of the constellation with different sensors or capabilities in addressing different applications, and developing methods for fusing non-contemporaneous information to build capabilities that can only be achieved through a distributed system.

This paper provides some examples of how mixed sensor constellations can be utilised to offer a new dimension in small satellite constellation design.