

SMALL SATELLITE MISSIONS SYMPOSIUM (B4)  
Small Satellites Potential for Future Integrated Applications and Services (4)

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CUBESAT FORMATION FLYING: A SUITABLE PLATFORM FOR SPACE SITUATIONAL  
AWARENESS APPLICATIONS.

**Abstract**

The paper presents an evaluation of Space applications suitable for a nanosatellites formation flying missions in context of Space Situational Awareness. The nanosatellites formation flying can cover the niche of local distributed monitoring applications starting from common space weather applications (magnetic field distributed measurements on a specific area, gamma radiation monitoring, ionosphere measurements, etc.) to more complex space debris localization. Another advantage of formation flying missions is represented by the scalability of the formation covered area during the mission lifetime. In this case a specific parameter can be monitored starting from a small area (close formation flying mission phase) to the entire orbit path. One step forward is the utilization of cubesats formation members as nodes in a distributed processing system where all satellites are connected in a mobile ad-hoc network sharing their resources for solving complex tasks and relaying not raw data, but partially or completely computed data to the ground stations. In terms of cost, a major importance is the use of commercial off the shelf components (COTS) in designing and building the subsystems of nanosatellites. Moreover, due to the rapid rise in cubesat developing for the educational purpose, entire subsystems are now on the market and had been successfully in flight tested. Regarded as a liability by well established companies, COTS components decrease the development periods of space missions while also driving low their overall costs. Also their reliability proved to be well above previous expectations as nanosatellites with just 1-2 years predicted lifetime reached operation lifetimes of more than 5 years with little functionality losses. From the formation flying perspective, mission reliability is another major advantage since losing one or few cubesats do not affect the entire mission.