

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

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PLURIBUS PROJECT: NANOSATELLITES FORMATION FLYING IN A NETWORKED
ENVIRONMENT

Abstract

The paper presents the Romanian effort in developing a nanosatellite system capable of maintaining a close orbital formation flying. The on-orbit data network will consist of interconnected satellites equipped with remote sensing cameras, various sensors and onboard computers to run data fusion algorithms by means of parallel processing. The resulted processed data will be later transmitted to the ground stations. In achieving this goal, several research directions are prioritized: mathematical modeling for close orbital formation flying, maintaining the formation by means of specific actuator systems, connecting by wireless the satellites for wider bandwidth communications, data fusion algorithm implementation and network processing using the GRID middleware, building a communication system for satellite – ground station transmissions. The system will be completed by building a ready-for-launch experimental group of flight-capable satellites. A system of nanosatellites in formation flying in a networked environment will be derived from the GOLIAT cubesat nanosatellite. The advantages of this system are the low costs and the high reliability which can facilitate the specialization of a given mission for a certain type of application: environment monitoring, space weather, agriculture, security, communications and research. Another major advantage this project brings is the development of a space system whose costs shift from the hardware area to software and conceptual modeling. The project will be using mostly COTS (Commercial Off-The-Shelf) components integrated with an innovative component far superior to the hardware costs. The research program is lead by the Romanian Space Agency and includes several national space research institutes and space filed related universities.