2021 IEEE INTERNATIONAL WORKSHOP ON

Metrology for AeroSpace

MetroAeroSpace2021

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NAPLES, ITALY

www.metroaerospace.org

CALL for PAPERS

for the Special Session on

MEASUREMENTS AND INSTRUMENTATION FOR AUTONOMOUS SPACECRAFT AND PLANETARY EXPLORATION

ABSTRACT

Contributions are welcomed in the field of Space and Aerospace measurement instruments for remote and in situ sensing, highlighting metrological characterization and calibration. Contributions are expected on attitude and position measurements for autonomous spacecraft and vehicles oriented towards Guidance, Navigation and Control, precision landing, relative and absolute positioning, global and local map building, planetary environment characterisation. Advances in the calibration procedures are also welcomed.

A growing interest in in-situ operations for the exploration of planetary bodies is demonstrated by the many planned mobile robotic missions for the upcoming years such as ESA Mars2020, NASA Mars2020, ROSCOSMOS Luna-25 and DLR/JAXA Mars Moons eXploration. To this end, novel technologies for mapping, navigation and terrain analysis are required. We encourage contributions on novel sensor setups and designs for both perception (LiDARs, cameras, etc.) and interaction with the environment, as well as novel calibration techniques.

The reproducibility of Space and Aerospace environment as well the design, realization and characterization of on the ground facilities are encouraged. Space-based measurements for planetary observations and atmospheric investigations are welcomed.

TOPICS

Topics for this Special Session include but are not limited to:

- Measurements and simulation systems for attitude and position control;
- Perception and Navigation in GNSS-denied environments;
- LiDAR-based and Vision-based navigation and mapping for planetary robots;
- LiDAR-based and Vision-based relative navigation between spacecraft or for formation flight;
- Relative navigation techniques for rendezvous and docking maneuvers between spacecraft;
- Instrumentation and measurements for the navigation of UAV in planetary environments;
- Sensor fusion techniques for aerospace applications;
- Calibration techniques for LiDAR and Vision measurement systems, multi-sensor systems and sensor fusion approaches;
- Metrological evaluation and characterization of Machine Learning approaches for autonomous spacecraft and vehicles for space applications and planetary exploration;
- Perception and manipulation for in-situ analysis and sample collection;
- Testing facilities for space environment reproducibility;
- Space Instrumentation and Measurements for Remote Sensing;
- Instrumentation and measurements for planetary probes.

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