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IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

Special Issue on “LuTan-1: An Innovative L-band Spaceborne Bistatic Interferometric SAR System”

LuTan-1 is an innovative spaceborne Synthetic Aperture Radar (SAR) mission with bistatic interferometry capability. The LuTan-1 mission is composed of a constellation of two identical satellites, each carrying an advanced L-band full-polarimetric SAR with an antenna of 3.4 by 9.8 m. The mission provides data with spatial resolution down to 3 m and swath up to 400 km. Since the launch in early 2022, two operation stages have been planned. In the first stage, LuTan-1 operates in the bistatic mode with a baseline of 700 to 7000 m, allowing single-pass interferometry. Almost all regions of China have been imaged in this mode and a DEM with an absolute accuracy of better than 5 m has been generated. After December 2022, LuTan-1 switched to the second stage, the pursuit or mono-static mode, where two satellites adopt the same orbit plane with a 180° orbital phasing difference. In this stage, LuTan-1 has a minimum revisit time of 4 days and the compact polarization capability, making its data unique and powerful.

LuTan-1 has completed its commissioning phase in May 2023. In the next few years, the mission will provide a continuous stream of SAR images to researchers. The highly coherent L-band data and unique capabilities are expected to support many state-of-the-art radar technology demonstration, innovative applications, and to provide new observations and approaches to better understand the Earth system.

This special issue invites manuscript submissions related to LuTan-1 in three aspects: 1) the LuTan-1: An Innovative L-band Spaceborne Bistatic Interferometric SAR System system calibration, validation and signal processing methods, such as the time and phase synchronization in the bistatic mode; 2) innovative data mining methods and applications of InSAR, PolInSAR and so on; 3) science discoveries and new understandings of the cryosphere, ecosystem, hydrology and solid Earth.

Topics includes, but are not limited to:

- System, Mode and Experiments;
- System calibration techniques, validation methods and results;
- Signal processing methods and tools for focusing, anti-unintentional interferencing, polarization, interferometry and its time series analysis, etc.;
- Applications of LuTan-1 data in natural resource survey and mapping, disaster responses and infrastructure monitoring, etc.;
- Insights into the local, regional and global environment and Earth surface processes, such as vertical land motion, tectonics, volcanology, cryosphere, hydrology, etc.;
- Synergetic use LuTan-1 with other airborne and spaceborne SAR data;

Schedule

Sep 01, 2023 Submission system opening

May 31, 2024 Submission system closing

Format

All submissions will be peer reviewed according to the IEEE Geoscience and Remote Sensing Society guidelines. Submitted articles should not have been published or be under review elsewhere. Submit your manuscript on <http://mc.manuscriptcentral.com/jstars>, using the Manuscript Central interface and select the “LuTan-1: An Innovative L-band Spaceborne Bistatic Interferometric SAR System” special issue manuscript type. Prospective authors should consult the site <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8855039> for guidelines and information on paper submission. All submissions must be formatted using the IEEE standard format (double column, single spaced). Please visit http://www.ieee.org/publications_standards/publications/authors/author_templates.html to download a template for transactions. Please note that as of Jan. 1, 2020, IEEE J-STARS has become a fully open-access journal charging a flat publication fee \$1,250 per paper.

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