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

Special Issue on
“Advances in Geosynchronous Synthetic Aperture Radar Systems, Signal Processing, and Applications”

Operating in an orbit with an altitude of c.a. 36000 km, Geosynchronous Synthetic Aperture Radar (GEO SAR) can achieve large-scale (thousands of kilometers) and quick revisit (< 24 hours) observations towards scenes of interest. Thus, compared with Low-Earth-Orbit SAR, it is considered a promising spaceborne sensor for disaster monitoring. Although there is no GEO SAR in orbit, its concept is hardly new. As early as 1978, GEO SAR was firstly proposed for wide coverage and high temporal-sampling imaging. However, the demanded large antenna and power requirement made it difficult to realize at that time, and, hindered GEO SAR research for over 15 years. With the development of antenna and satellite platforms, GEO SAR has been a hotspot in the spaceborne remote sensing field nowadays. Many representative concepts of GEO SAR, such as Global Earthquake Satellite System (GESS) and Advanced Radar Geosynchronous Observation System (ARGOS), have been proposed and studied. Hydroterra, a GEO SAR concept to observe and understand key processes of the daily water cycle and to enable the near real-time prediction of ground motion, has also been selected as a candidate for the European Space Agency Earth Explorer 10 (EE10) Mission to be deeply studied. Especially, a GEO SAR is now under development in China and will be launched in a few years.

Up to now, several major applications of GEO SAR, including surface deformation retrieval, water cycle observation, moving target detection, tomography, et al., have been proposed. Nevertheless, due to its curve trajectories, squint imaging mode, and long integrating time, it is still quite challenging to realize the above applications in excellent performance under diverse concepts. Novel ideas in concept proposal, system optimization, accurate signal modeling, and high-efficient data processing strategy need to be studied to address the aforementioned issues, which are also of great value to pave a way for new scientific and engineering applications by using GEO SAR.

The broad topics include (but are not limited to):

- Innovative GEO SAR concepts/systems/modes
- Technology to implement GEO SAR
- Comparison between GEO SAR and other short revisit systems
- GEO SAR imaging algorithms
- Distributed/Bistatic/Multistatic GEO SAR systems/data processing algorithm/application
- Atmospheric error analyses and corrections in GEO SAR
- GEO InSAR/D-InSAR/TomoSAR/moving target indication/detection/imaging
- Advanced/Potential GEO SAR applications
- Applications of artificial intelligence in GEO SAR signal processing

Schedule

Feb. 1, 2023 Submission system opening

Aug. 31, 2023 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 “**Advances in Geosynchronous Synthetic Aperture Radar Systems, Signal Processing, and Applications**” special issue manuscript type. Prospective authors should consult the site <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9082768> 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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