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

Special Issue on

Multi-Channel Space-Based SAR

Aims and scope

With the advent of phased-array SAR antennas with two parallel receive channels on the most recent generation of commercial/civilian spacecraft, such as RADARSAT-2, TerraSAR-X, TanDEM-X and the future PAZ, relatively mature single-channel SAR imaging is evolving into advanced, multi-aperture SAR concepts. The spatial diversity of multiple parallel receive channels is, for instance, being used to discriminate moving objects from the stationary background, to determine the underlying topography of the backscattering terrain or the large-scale surface motion using single-pass interferometry. The flexible programmability of this newest generation of SAR satellites, in conjunction with sophisticated array signal processing algorithms, promises entirely novel capabilities, which were not previously possible. As an example, dual aperture modes and High-Resolution Wide Swath imaging techniques overcome the inherent physical swath width-versus-resolution limitations of conventional single-channel SAR systems. It is expected that innovative future space radar concepts with many parallel channels and waveform diversity will open up new areas of research and applications, such as fully adaptive digital beamforming in azimuth and elevation to dramatically increase SNR and hence coverage, to enhance resilience against electronic countermeasures, or to resolve individual scatterers within a resolution cell. Many of these methods have been proven using ground-based and airborne systems, but are only recently being considered and realized on space-based platforms due to cost and resource limitations. This special issue invites submissions on recent advances in scientific and technological solutions to the special challenges posed by putting multiple channels on space-based SAR platforms, as well as current and future concept studies.

Key topics to be covered by the Special Issue include (but are not limited to):
Digital Beamforming (DBF),
Single-pass Across-Track and Along-Track Interferometry,
Ground Moving Target Indication (GMTI),
High-resolution Wide Swath (HRWS) Imaging,
Multiple Input Multiple Output (MIMO) SAR,
Novel SAR concepts and design with multi-channel capabilities (e.g. TerraSAR-X2)

Submission guidelines

All submissions will be peer reviewed according to the IEEE and Geoscience and Remote Sensing Society guidelines. Submitted articles should not have been published or be under review elsewhere. Manuscripts should be submitted online at http://mc.manuscriptcentral.com/jstars. Prospective authors should consult this site for guidelines and information on paper submission. Please select "multi-channel space-based SAR" as manuscript type. Information about the Journal can be found at http://www.grss-ieee.org/Publications/JSTARS/. Please note that IEEE JSTARS applies a mandatory excessive page length charge of $175 per page (beginning with page 7 and beyond). Authors are responsible for all page charges.

Important dates

Manuscripts due: December 31, 2014
Expected publication date: October, 2015

Guest editors

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