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

Special Issue on "Quantum resources for Earth Observation"

Quantum theory is rapidly evolving in various advanced technologies with impact to space applications. Quantum technology is already present in space, e.g., quantum key distribution. Latest investigation results validate the feasibility of actual applications and many other resources with unprecedented potentials such as quantum simulations, computing, imaging, sensing, metrology, optimization or machine learning are at the edge of maturity. We are at the beginning of a paradigm shift, which is largely impacting Earth Observation (EO). The open or easy access to early quantum computers represents a huge potential to discover new solutions and broaden the applications of EO. An increasing amount of research in communications, optics, physics, and nanotechnologies provide fantastic opportunities to implement disruptive data analytics methods or instruments for space applications. Quantum sensing and imaging enable new measurements and observation concepts of physical quantities, achieving higher levels of accuracy beyond the classical limits. Quantum simulations can boost the forecast of climate and our planet phenomena, and quantum computing can solve challenges of the Big EO Data, with novel Data Science and Artificial Intelligence (AI) solutions. These developments are offering numerous opportunities to contribute to the research and engineering aspects of quantum technologies. The Special Issue aims to introduce this extraordinary field to the GRSS community, present the current state-of-the-art in quantum technologies, identify challenges and opportunities, and engage the quantum community for EO in the long-term.

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

- Quantum gravity sensors
- Quantum sensing & metrology in optical and microwave spectrum
- Quantum ghost imaging
- Quantum radar and lidar
- Quantum algorithms, Machine and Deep Learning, Artificial Intelligence
- Modeling and simulation
- Optimized algorithms and applications
- Other topics related to quantum communications for space sensor networks
- Mission planning
- Applications to climate changes, natural disasters such as earthquakes, draughts or floods, energy or food resources

Schedule

December 1, 2020: Submission system opening
May 30, 2021: 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 "**Quantum resources for Earth Observation**" 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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