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Advances in GNSS Radio Occultation Technique and Applications

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Message from the Guest Editors

The Global Navigation Satellite System (GNSS) radio occultation (RO) technique for Earth's atmospheric soundings has rapidly developed over the 25 years since the launch of the proof-of-concept GPS/MET mission in 1995. By tracking GNSS signals from the low-Earth orbiting satellites and measuring the signal delay and bending, profiles of temperature, pressure, and water vapor in the neutral atmosphere and electron density in the ionosphere can be derived. Tens of subsequent RO missions and numerous studies have proved that the high accuracy, precision, and vertical resolution of RO data make them ideal to study atmospheric and ionospheric structures and processes, monitor climate change, initialize and verify numerical weather prediction models, and improve weather and space weather forecasts. This Issue is to review and assess GNSS RO remote sensing and missions, deepen our understanding of retrieval errors and improve RO retrievals, improve the impact of RO data in global and regional NWP forecasts, and to demonstrate the progress of RO applications in weather, climate and ionospheric research. We sincerely invite you to submit your research results to this Special Issue.

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Message from the Editor-in-Chief

Continued developments in instrumentation and modeling have driven atmospheric science to become increasingly more complex with a deeper understanding of concepts, mechanisms, and interactions. This is the field that innovation built and it has led to a better appreciation for the complexity with atmosphere. Human life is intertwined in this complexity as we strive to better understand our atmosphere. Climate change is constantly stretching the limits of our thinking and forcing new ideas and concepts to be played out. Welcome to the Anthropocene!

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