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Application of Satellite-Based Precipitation Estimates Using Machine Learning and Numerical Modeling

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Message from the Guest Editors

Around the world, the availability of high resolution has been recognized as a crucial achievement, and satellite-based products have been applied in many disciplines. However, these satellite-based estimates might contain systematic as well as random biases.

Assessing the accuracy and performance is a prerequisite before using them for hydrologic and water resources planning or decision-making. Blending satellite-based estimates, ground-based rain gauges, and reanalysis data could augment our understanding of the spatiotemporal characteristics of precipitation, particularly in data-scarce regions. Similarly, downscaling and bias-correcting the satellite-based estimates are equally crucial to get information on a local scale. Several techniques, including artificial intelligence (AI) and machine learning (ML), play an instrumental role while using these satellite-based precipitation estimates.

This Special Issue aims to collect the state-of-the-art contributions appraising the use of satellite-based precipitation estimates. In particular, to understand the spatiotemporal distribution of weather variables and their atmospheric mechanisms during extreme weather events.

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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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