Special Issue Reprint

Accuracy and Quality Control of Remote Sensing Data

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Remote sensing enables global monitoring, but the growing number of sensors requires strict compliance and high radiometric accuracy for consistent data use. Reliable results depend on regular spectral, radiometric, and geometric CAL/VAL, especially for spaceborne hyperspectral sensors. Data quality is affected by the following: Atmospheric effects: Residual noise after correction, including the adjacency effect from multiple scattering; Sensor issues: Geometric anomalies such as band-to-band misregistration in multispectral push-broom systems (e.g., Sentinel-2 MSI); Uncertainty: Errors linked to aerosol models, AOD retrieval, ground reflectance, and BRDF. This Special Issue focuses on three themes: 1. Calibration and Quality Assessment: Advances such as the Radiometric Calibration–Reflectance Inversion Iterative (RCRII) method for adjacency-effect correction, Solar Diffuser BRDF measurements for on-board calibration, and mission quality assessments (e.g., GF-7, SDGSAT-1). Geometric performance is evaluated using frameworks like EDAP for metrics such as SNR and MTF. 2. Product Validation and Geophysical Parameters: Validation of thematic products and physical variables, including Permafrost Active Layer Thickness from airborne SAR vs. GPR, Copernicus HRL Imperviousness Density, and checks of geometric accuracy and thematic stability for sensors like PRISMA. 3. Advanced Processing and Modeling: Methods such as parsimonious gap-filling for sub-daily ETa and integrating photogrammetry with Structure from Motion using Quadrifocal Tensor techniques for positioning and calibration of High Oblique Frame Sweep aerial cameras.

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