



Remote Sensing for Greenhouse Gases from Natural Sources

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Message from the Guest Editors

Although most greenhouse gas emissions result from industrial and anthropogenic sources, a significant contribution also comes from natural sources. This is especially true for carbon dioxide (CO₂) and methane (CH₄), two of the main Earth greenhouse gases that are massively released in the terrestrial atmosphere by active and quiescent volcanoes, hydrothermal areas, and active tectonic structures.

Measuring these gases in the subaerial environment is challenging due to their mixing with the atmosphere and then their rapid dilution. Proximal remote sensing techniques, performed by airborne and unmanned aerial vehicles (UAVs), would be the ideal approach to measure gas emissions close to the source (at the scale of the volcanic edifice or small-sized hydrothermal areas). On the other hand, data assimilation and remote sensing procedures from satellite platforms would be extremely useful to quantify the global natural budgets in larger zones or from stronger sources, where the amount of natural gas is sufficiently high above the background atmospheric content (e.g., crustal tectonic structures or major fault systems).





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