
[JJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-CG Complex & General

[A-CG40]Material Circulations in Land Ecosystems

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Thu. May 24, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Terrestrial ecosystem influences global climate through circulations of water, carbon, and nitrogen between land surface and atmosphere. For better understanding of those behaviors, a great effort has been paid for developing varieties of approaches and techniques such as biometric survey, eddy and chamber methods, near and satellite remote sensing, biosphere modeling and so on.

In particular, the JapanFlux, founded in 2006 as a researchers network of CO₂, H₂O and other trace gas flux measurement, has promoted the multi-disciplinary studies not only for flux measurement community, but also for remote sensing and biosphere modeling communities. Moreover, the Research-Group-on-Integrated-Land-Processes, which was founded in 2006, also has contributed to build networks between Japanese researchers to better understanding of physical and biological processes on interactions between terrestrial surface and atmosphere.

This session unites those multi-disciplinary activities, and promotes the oral and poster presentations on the role of terrestrial ecosystem in material circulations of water, carbon, nitrogen, energy and other substances by any approaches and techniques. This session takes over the former session in last year: A-CG47.

[ACG40-P01]The acclimation effects on responses of chlorophyll fluorescence, spectral reflection, and photosynthesis of leaves

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Keywords:Chlorophyll Fluorescence, Remote Sensing, Photochemical Reflectance Index

Carbon dioxide assimilation (Gross Primary Production; GPP) by photosynthesis of terrestrial plants is the largest carbon flux in terrestrial ecosystems, therefore it is very important from the viewpoint of carbon evaluation to accurately estimate it. Satellite remote sensing method is the unique method to estimate GPP from the landscape to global scale. In recent years, it has been found that it is possible to observe chlorophyll fluorescence (Solar-Induced Fluorescence; SIF) of vegetation induced by sunlight from artificial satellites. Here, chlorophyll fluorescence is a phenomenon in which chloroplasts of plants emit red to far-red light when they absorb light. Since its intensity reflects the state of the photosynthetic circuit, SIF is expected as a new indicator of GPP. However, chlorophyll fluorescence is one of three paths (photochemical reaction, heat dissipation, fluorescence) of absorbed light energy, therefore it is necessary to estimate the parameter of heat dissipation from the remote sensing index in order to accurately estimate the yield of the photochemical reaction. In addition, leaves in the ecosystem are acclimated to various environments and have different photosynthetic properties, so it is necessary to study the characteristics of the 3 pathways. In this study, we aimed to investigate the influence of optical acclimation on three paths of photosynthesis, chlorophyll fluorescence, heat dissipation.