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Research outputs

An in situ approach for validation of canopy chlorophyll fluorescence radiative transfer models using the full emission spectrum

Liu, W., Möttus, M., Malenovský, Z., Shi, S., Alonso, L., Atherton, J. & Porcar-Castell, A., 1 Jan 2025, In: *Remote Sensing of Environment*. 316, 13 p., 114490.

Hyperspectral Imaging Reveals Differential Carotenoid and Chlorophyll Temporal Dynamics and Spatial Patterns in Scots Pine Under Water Stress

Miettinen, I., Zhang, C., Alonso, L., Fernández-Marín, B., García-Plazaola, J. I., Grebe, S., Porcar-Castell, A. & Atherton, J., 27 Oct 2024, In: *Plant Cell and Environment*.

Seasonal and vertical variation in canopy structure and leaf spectral properties determine the canopy reflectance of a rice field

Liu, W., Möttus, M., Gastellu-Etchegorry, J.-P., Fang, H. & Atherton, J., 15 Aug 2024, In: *Agricultural and Forest Meteorology*. 355, 14 p., 110132.

Analysing far-red SIF directional anisotropy of three structurally contrasting forest canopies towards improved GPP estimation

Liu, W., Atherton, J., Möttus, M., Malenovský, Z., Luo, S., Zhang, Y. & Gastellu-Etchegorry, J.-P., 15 Jul 2023, In: *Agricultural and Forest Meteorology*. 338, 14 p., 109531.

Investigating Foliar Macro- and Micronutrient Variation with Chlorophyll Fluorescence and Reflectance Measurements at the Leaf and Canopy Scales in Potato

Oivukkamäki, J., Atherton, J., Xu, S., Riikonen, A., Zhang, C., Hakala, T., Honkavaara, E. & Porcar-Castell, A., 9 May 2023, In: *Remote Sensing*. 15, 10, 33 p., 2498.

The photosynthetic response of spectral chlorophyll fluorescence differs across species and light environments in a boreal forest ecosystem

Rajewicz, P., Zhang, C., Atherton, J., Van Wittenberghe, S., Riikonen, A., Magney, T., Fernandez-Marín, B., Garcia-Plazaola, J. I. & Porcar-Castell, A., 2023, In: *Agricultural and Forest Meteorology*.

Uncrewed aircraft system spherical photography for the vertical characterization of canopy structural traits

Costa, V. A. R., Durand, M., Robson, T. M., Porcar-Castell, A., Korpela, I. & Atherton, J., Apr 2022, In: *New Phytologist*. 234, 2, p. 735-747 13 p.

What Does the NDVI Really Tell Us About Crops? Insight from Proximal Spectral Field Sensors

Atherton, J., Zhang, C., Oivukkamäki, J., Kulmala, L., Xu, S., Hakala, T., Honkavaara, E., MacArthur, A. & Porcar-Castell, A., 2022, *Springer Optimization and Its Applications*. Springer, p. 251-265 15 p. (Springer Optimization and Its Applications; vol. 182).

Structural and photosynthetic dynamics mediate the response of SIF to water stress in a potato crop

Xu, S., Atherton, J., Riikonen, A., Zhang, C., Oivukkamäki, J., MacArthur, A., Honkavaara, E., Hakala, T., Koivumäki, N., Liu, Z. & Porcar-Castell, A., 15 Sept 2021, In: *Remote Sensing of Environment*. 263, 16 p., 112555.

Chlorophyll a fluorescence illuminates a path connecting plant molecular biology to Earth-system science

Porcar-Castell, A., Malenovsky, Z., Magney, T., Van Wittenberghe, S., Fernandez-Marín, B., Maignan, F., Zhang, Y., Maseyk, K., Atherton, J., Albert, L. P., Robson, T. M., Zhao, F., Garcia-Plazaola, J.-I., Ensminger, I., Rajewicz, P. A., Grebe, S., Tikkanen, M., Kellner, J. R., Ihalainen, J. A. & Rascher, U. & 1 others, Logan, B., 9 Aug 2021, In: *Nature plants*. 7, 8, p. 998–1009 12 p.

Measuring solar-induced fluorescence from unmanned aircraft systems for operational use in plant phenotyping and precision farming

Bendig, J., Chang, C. Y., Wang, N., Atherton, J., Malenovsky, Z. & Rascher, U., 16 Jul 2021, *IEEE International Geoscience and Remote Sensing Symposium IGARSS*. IEEE, p. 1921-1924 4 p. (IGARSS).

Beyond APAR and NPQ: Factors Coupling and Decoupling SIF and GPP Across Scales

Porcar-Castell, A., Malenovský, Z., Magney, T., van Wittenberghe, S., Fernández-Marín, B., Maignan, F., Zhang, Y., Maseyk, K., Atherton, J., Albert, L. P., Robson, T. M., Zhao, F., Garcia-Plazaola, J. I., Ensminger, I., Rajewicz, P. A., Grebe, S., Tikkanen, M., Kellner, J. R., Ihalainen, J. A. & Rascher, U. & 1 others, Logan, B., 2021, *2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS*. IEEE, p. 1925-1927 3 p.

On the Estimation of the Leaf Angle Distribution from Drone Based Photogrammetry

Xu, S., Zaidan, M. A., Honkavaara, E., Hakala, T., Viljanen, N., Porcar-Castell, A., Liu, Z. & Atherton, J., 2020, *IGARSS 2020 - 2020 IEEE International Geoscience and Remote Sensing Symposium*. IEEE, p. 4379-4382 4 p. 9323498. (IEEE International Symposium on Geoscience and Remote Sensing IGARSS).

Simulation-Based Evaluation of the Estimation Methods of Far-Red Solar-Induced Chlorophyll Fluorescence Escape Probability in Discontinuous Forest Canopies

Liu, W., Luo, S., Lu, X., Atherton, J. & Gastellu-Etchegorry, J.-P., 2020, In: *Remote Sensing*. 12, 23, 3962.

Do all chlorophyll fluorescence emission wavelengths capture the spring recovery of photosynthesis in boreal evergreen foliage?

Zhang, C., Atherton, J., Penuelas, J., Filella, I., Kolari, P., Aalto, J., Ruhanen, H., Back, J. & Porcar-Castell, A., Dec 2019, In: *Plant, Cell and Environment*. 42, 12, p. 3264-3279 16 p.

Simulating solar-induced chlorophyll fluorescence in a boreal forest stand reconstructed from terrestrial laser scanning measurements

Liu, W., Atherton, J., Möttus, M., Gastellu-Etchegorry, J.-P., Malenovský, Z., Raunonen, P., Åkerblom, M., Mäkipää, R. & Porcar-Castell, A., Oct 2019, In: *Remote Sensing of Environment*. 232, 15 p., 111274.

Nocturnal Light Emitting Diode Induced Fluorescence (LEDIF): A new technique to measure the chlorophyll a fluorescence emission spectral distribution of plant canopies in situ

Atherton, J., Liu, W. & Porcar-Castell, A., 15 Sept 2019, In: *Remote Sensing of Environment*. 231, 12 p., 111137.

A mechanistic model of winter stem diameter dynamics reveals the time constant of diameter changes and the elastic modulus across tissues and species

Lindfors, L., Atherton, J., Riikonen, A. & Holtta, T., 15 Jul 2019, In: *Agricultural and Forest Meteorology*. 272, p. 20-29 10 p.

Leaf-Level Spectral Fluorescence Measurements: Comparing Methodologies for Broadleaves and Needles

Rajewicz, P. A., Atherton, J., Alonso, L. & Porcar-Castell, A., 1 Mar 2019, In: *Remote Sensing*. 11, 5, 20 p., 532.

Diurnal and Seasonal Solar Induced Chlorophyll Fluorescence and Photosynthesis in a Boreal Scots Pine Canopy

Nichol, C. J., Drolet, G., Porcar-Castell, A., Wade, T., Sabater, N., Middleton, E. M., MacLellan, C., Levula, J., Mammarella, I., Vesala, T. & Atherton, J., 1 Feb 2019, In: *Remote Sensing*. 11, 3, 22 p., 273.

UV-screening and springtime recovery of photosynthetic capacity in leaves of *Vaccinium vitis-idaea* above and below the snow pack

Solanki, T., Aphalo, P. J., Neimane, S., Hartikainen, S. M., Pieristè, M., Shapiguzov, A., Porcar Castell, J. A., Atherton, J. M., Heikkilä, A. & Robson, T. M., Jan 2019, In: *Plant Physiology and Biochemistry*. 134, p. 40-52 13 p.

When the sun never sets: daily changes in pigment composition in three subarctic woody plants during the summer solstice

Fernández-Marín, B., Atherton, J., Olascoaga, B., Kolari, P., Porcar Castell, A. & García-Plazaola, J. I., Apr 2018, In: *Trees : Structure and Function*. 32, 2, p. 615-630 16 p.

Drone Measurements of Solar-Induced Chlorophyll Fluorescence Acquired with a Low-Weight DFOV Spectrometer System

Atherton, J., MacArthur, A., Hakala, T., Maseyk, K., Robinson, I., Liu, W., Honkavaara, E. & Porcar-Castell, A., 2018, *IGARSS 2018: 2018 IEEE International Geoscience and Remote Sensing Symposium*. IEEE, p. 8834-8836 3 p. (IEEE International Symposium on Geoscience and Remote Sensing IGARSS).

Investigating Forest Photosynthetic Response to Elevated CO₂ Using UAV-Based Measurements of Solar Induced Fluorescence

Maseyk, K., Atherton, J., Thomas, R., Wood, K., Tausz-Posch, S., MacArthur, A., Porcar-Castell, A. & Tausz, M., 2018, *IGARSS 2018: 2018 IEEE International Geoscience and Remote Sensing Symposium*. IEEE, p. 8830-8833 4 p. (IEEE International Symposium on Geoscience and Remote Sensing IGARSS).

Upscaling of solar induced chlorophyll fluorescence from leaf to canopy using the DART model and a realistic 3D forest scene

Liu, W., Atherton, J. M., Möttus, M., MacArthur, A., Teemu, H., Maseyk, K., Robinson, I., Honkavaara, E. & Porcar Castell, J. A., 25 Oct 2017, *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 107-111 ed. ISPRS, Vol. XLII-3/W3. p. 1-5 5 p. (The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences).

Spatial Variation of Leaf Optical Properties in a Boreal Forest Is Influenced by Species and Light Environment

Atherton, J., Olascoaga, B., Alonso, L. & Porcar-Castell, A., 14 Mar 2017, In: *Frontiers in plant science*. 8, 14 p., 309.

A new method to measure chlorophyll a fluorescence spectra emitted from whole tree canopies

Atherton, J. M., Liu, W. & Porcar Castell, J. A., 2017, *Proceedings of 'The Centre of Excellence in Atmospheric Science (CoE ATM) - From Molecular and Biological processes to The Global Climate' Annual Meeting 2017*. Haapanala, P., Lintunen, A., Enroth, J. & Kulmala, M. (eds.). Helsinki: Finnish Association for Aerosol Research FAAR, p. 143-145 3 p. (Report Series in Aerosol Science; no. 202).

A comparison of methods to estimate photosynthetic light absorption in leaves with contrasting morphology

Olascoaga, B., MacArthur, A., Atherton, J. & Porcar-Castell, A., 2016, In: *Tree Physiology*. 36, 3, p. 368-379 12 p.

Using Spectral Chlorophyll Fluorescence and the Photochemical Reflectance Index to Predict Physiological Dynamics

Atherton, J. M., Nichol, C. J. & Porcar Castell, J. A., 2016, In: *Remote Sensing of Environment*. 176, p. 17-30 14 p.

Onset of photosynthesis in spring speeds up monoterpene synthesis and leads to emission bursts

Aalto, J., Porcar-Castell, A., Atherton, J., Kolari, P., Pohja, T., Hari, P., Nikinmaa, E., Petäjä, T. & Bäck, J., Nov 2015, In: *Plant, Cell and Environment*. 38, 11, p. 2299-2312 14 p.

ASSESSING OPTICAL PROPERTIES IN LEAVES

Olascoaga Gracia, B., MacArthur, A., Atherton, J. M. & Porcar Castell, J. A., 2014, *Proceedings of 'the Center of Excellence in Atmospheric Sciences (CoE ATM) : From Molecular and Biological Processes to the Global Climate' Annual Meeting 2014*. Kulmala, M., Lintunen, A. & Kontkanen, J. (eds.). Helsinki: Finnish Association for Aerosol Research, FAAR, p. 484-486 3 p. (Report Series in Aerosol Science; no. 157 (2014)).

Linking chlorophyll a fluorescence to photosynthesis for remote sensing applications: mechanisms and challenges

Porcar-Castell, A., Tyystjärvi, E., Atherton, J., van der Tol, C., Flexas, J., Pfuendel, E. E., Moreno, J., Frankenberg, C. & Berry, J. A., 2014, In: *Journal of Experimental Botany*. 65, 15, p. 4065-4095 31 p.

MEASUREMENT AND MODELLING OF PHYSIOLOGICAL LEAF OPTICAL DYNAMICS

Atherton, J. M., Nichol, C., Olascoaga Gracia, B. & Porcar Castell, J. A., 2014, *Proceedings of 'the Center of Excellence in Atmospheric Sciences (CoE ATM): From Molecular and Biological Processes to the Global Climate' Annual Meeting 2014*. Kulmala, M., Lintunen, A. & Kontkanen, J. (eds.). Helsinki: Finnish Association for Aerosol Research, FAAR, p. 175-178 4 p. (Report Series in Aerosol Science; no. 157 (2014)).

Interpretation of temporal dynamics in leaf-level chlorophyll fluorescence: a mechanistic model

Porcar-Castell, A., Olascoaga Gracia, B., Atherton, J. M., Berninger, F. & Kolari, P., 2013, *Proceedings of FCoE in 'Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change' Annual Meeting 2013*. p. 452-454 3 p. (Report Series in Aerosol Science; vol. Nro 142 (2013)).