

引用文献

- ADC (2003) OP-2 Open-path CO₂/H₂O Analyser Instruction Manual, ADC BioScientific Ltd., 25pp.
- アドバネット (1996) 炭酸ガス・水蒸気変動計 E009B 取扱説明書, 第1版, 13pp.
- Albrecht B., Poellot M. and Cox S. K. (1974) Pyrgeometer measurements from aircraft, *Review of Scientific Instruments*, 45:33-38.
- Amiro, B. (2010) Estimating annual carbon dioxide eddy fluxes using open-path analysers for cold forest sites, *Agricultural and Forest Meteorology*, 150:1366-1372.
- AsiaFlux 運営委員会編 (2003) 陸域生態系における二酸化炭素等のフラックス観測の実際, CGER-M015-2003, 116pp, 国立環境研究所地球環境研究センター.
- Aubinet M., Berbigier, P., Bernhofer, Ch., Cescatti, A., Feigenwinter, C., Granier, A., Grünwald, Th., Havrankova, K., Heinesch, B., Longdoz, B., Marcolla, B., Montagnani, L. and Sedlak P., (2005) Comparing CO₂ storage and advection conditions at night at different CARBOEUROFLUX sites, *Boundary-Layer Meteorology*, 116:63-94.
- Aubinet M., Grelle A., Ibrum A., Rannik U., Moncrieff J., Foken T., Kowalski A. S., Martin P. H., Berbigier P., Bernhofer C., Clement R., Elbers J. A., Granier A., Grünwald T., Morgenstern K., Pilegaard K., Rebmann C., Snijders W., Valentini R. and Vesala T. (2000) Estimates of the annual net carbon and water exchange of forests: the EUROFLUX methodology, *Advances in Ecological Research*, 30:113-175.
- Aubinet M., Heinesch B. and Yernaux M. (2003) Horizontal and vertical advection in a sloping forest, *Boundary-Layer Meteorology*, 108:397-417.
- Baldocchi D., Falge E., Gu L., Olson R., Hollinger D., Running S., Anthoni P., Bernhofer Ch., Davis K., Evans R., Fuentes J., Goldstein A., Katul G., Law B., Lee X., Malhi Y., Meyers T., Munger W., Oechel W., Paw K. T., Pilegaard K., Schmid H. P., Valentini R., Verma S., Vesala T., Wilson K. and Wofsy S. (2001) FLUXNET: a new tool to study the temporal and spatial variability of ecosystem-scale carbon dioxide, water vapor, and energy flux densities, *Bulletin of the American Meteorological Society*, 82:2415-2434.
- Baldocchi D., Finnigan J., Wilson K., Paw U K. T. and Falge E (2000) On measuring net ecosystem carbon exchange over tall vegetation on complex terrain, *Boundary-Layer Meteorology*, 96:257-291.
- Baldocchi D., Valentini R., Running S., Oechel W. and Dahlman R. (1996) Strategies for measuring and modelling carbon dioxide and water vapour fluxes over terrestrial ecosystems, *Global Change Biology*, 2(3):15-168.
- Burba, G. G., Anderson, D. J., Xu, L. and McDermitt, D. K. (2005) Solving the off-season uptake problem: correcting fluxes measured with the LI-7500 for the effects of instrument surface heating. Progress report of an ongoing study. PART 1: THEORY, Poster presentation, AmeriFlux 2005 Annual Meeting, Boulder, Colorado.
- Burba G. G., McDermitt D. K., Grelle A., Anderson D. J. and Xu L. (2008) Addressing the influence of instrument surface heat exchange on the measurements of CO₂ flux from open-path gas analyzers, *Global Change Biology*, 14:1-23.
- Businger J. A. and Oncley S. P. (1990) Flux measurement with conditional sampling, *Journal of Atmospheric and*

- Oceanic Technology, 7:349-352.
- Campbell Scientific, Inc. (2006) Open Path Eddy Covariance System Operator's Manual CSAT3, LI-7500, and KH20, Campbell Scientific, Inc.
- Christen A., van Gorsel E., Vogt, R., Andretta M. and Rotach M. W. (2001) Ultrasonic anemometer instrumentation at steep slopes: Wind tunnel study - field Intercomparison - measurement, MAP Newsletter, 15:164-167. (http://pages.unibas.ch/geo/mcr/Crew/AC/pdfs/christen_map.pdf)
- Clement, R., Burba, G., Grelle, A., Anderson, D. and Moncrieff, J. (2009) Improved trace gas flux estimation through IRGA sampling optimization, Agricultural and Forest Meteorology, 149 (3-4):623-638.
- Finnigan J. (2006) The storage term in eddy flux calculations. Agricultural and Forest Meteorology, 136:108-113.
- Fluxnet CANADA (ed.) (2003) Fluxnet-Canada Measurement Protocols Working Draft Version 1.3, 109pp, Fluxnet-Canada Network Management Office.
- Giasson, M.-A., Coursolle, C. and Margolis, H. A. (2006) Ecosystem-level CO₂ fluxes from a boreal cutover in eastern Canada before and after scarification, Agricultural and Forest Meteorology, 140:23–40.
- Grelle A. and Lindroth A. (1996) Eddy-correlation system for long-term monitoring of fluxes of heat, water and CO₂, Global Change Biology, 2:297-308.
- Grelle, A. and Burba, G.G. (2007) Fine-wire thermometer to correct CO₂ fluxes by open-path analyzers for artificial density fluctuations, Agricultural and Forest Meteorology, 147(1-2): 48-57.
- Griffith D. W. T. (1982) Calculation of carrier gas effects in non-dispersive infrared analyzer. I. Theory, Tellus, 34:376-384.
- Griffith D. W. T., Keeling C. D., Adams J. A., Guenther P. R. and Bacastow R. B. (1982) Calculation of carrier gas effects in non-dispersive infrared analyzer. II. Comparisons with experiments, Tellus, 34:385-397.
- 郡司孝, 松岡延浩, 木村玲二, 今久 (2008) 細線熱電対と超音波風速温度計を用いた潜熱フラックス推定の試み, 農業気象学会 2008 年度全国大会講演要旨, 56.
- 花房龍男, 青島武, 渡来靖 (2005) 超音波風速温度計と熱電対温度計による潜熱輸送量の簡単な評価方法, 筑波大学陸域環境センター報告, 6:11-15.
- Hanafusa T., Fujitani T., Kobori Y. and Mitsuta Y. (1982) A new type sonic anemometer-thermometer for field operation, Papers in Meteorology and Geophysics, 33:1-19.
- Harazono, Y., Miyata, A., Ota, N. and Oechel, W. C. (2000) Greenhouse gas flux at Arctic tundra ecosystem in winter and thawing period, Proceedings of 24th Conference on Agricultural and Forest Meteorology, 193-194.
- Haslwanter, A., Hammerle, A., Wohlfahrt, G. (2009) Open-path vs. closed-path eddy covariance measurements of the net ecosystem carbon dioxide and water vapour exchange: A long-term perspective, Agricultural and Forest Meteorology, 149:291-302.
- 林真紀夫 (1988) 濕度の測定 In 農業気象の測器と測定法. 日本農業気象学会関東支部 (ed.), 農業技術協会, 51-81.
- Heusinkveld B. G., Jacobs A. F. G., and Holtslag A. A. M. (2008) Effect of open-path gas analyzer wetness on eddy covariance flux measurements: A proposed solution, Agricultural and Forest Meteorology, 148:1563-1573.

- Hignett P. (1992) Corrections to temperature measurements with a sonic anemometer, *Boundary-Layer Meteorology*, 61:175-187.
- 平野高司, 三枝信子 (2003) 3. 渦相関法によるフラックス測定の実際, In 陸域生態系における二酸化炭素フラックス観測の実際, AsiaFlux 運営委員会編, 9-24.
- Hirata, R., Hirano, T., Mogami, J., Fujinuma, Y., Inukai, K., Saigusa, N. and Yamamoto, S. (2005) CO₂ flux measured by an open-path system over a larch forest during snow covered season, *Phyton*, 45: 347-351.
- 廣瀬保雄, 柴田誠司 (2000) 円錐空洞黒体を用いた PIR 長波長放射計の校正 第一報:理論的考察, 高層気象台彙報, 60, 25-34.
- Horst T. W. and Oncley S. P. (2006) Corrections to inertial-range power spectra measured by CSAT3 and Solent sonic anemometers, I. Path-averaging errors, *Boundary-Layer Meteorology*, 119:375-395.
- 石田祐宣, 松島大, 樋口篤志, 檜山哲哉, 戸田求, 浅沼順, 玉川一郎, 宮崎真, 田中賢治, 杉田倫明, 永井秀幸, 田中久則, 飯田真一, 小林菜花子 (2004) 2001 年筑波大学陸域環境研究センター(TERC)における乱流計測機集中観測: 機器比較と校正による誤差の解析, 水文・水資源学会誌, 17:43-60.
- 伊藤芳樹, 林泰一, 玉川一郎 (2001) 超音波風速温度計 TR-61A(120°交差)型プローブ特性試験, 「熱・水収支の高精度評価に関する研究」平成 12 年度報告書, 1-9.
- Kaimal J.C. and Finnigan J.J. (1994) Atmospheric boundary layer flows, Oxford Univ. Press, 289pp.
- Kaimal J.C., Gaynor J. E., Zimmerman H. A. and Zimmerman G. A. (1990) Minimizing flow distortion errors in a sonic anemometer, *Boundary-Layer Meteorology*, 53:103-115.
- Kainal J.C. and Gaynor J. E. (1991) Another look at sonic thermometry, *Boundary-Layer Meteorology*, 56:401-410.
- Karl, T. G., C. Spirig, J. Rinne, C. Stroud, P. Prevost, J. Greenberg, R. Fall, and A. Guenther (2002) Virtual disjunct eddy covariance measurements of organic compound fluxes from a subalpine forest using proton transfer reaction mass spectrometry, *Atmospheric Chemistry and Physics*, 2:279-291.
- Kelliher, F. M., Leuning, R., Raupach, M. R., and Schulze, E. D. (1995) Maximum conductances for evaporation from global vegetation types, *Agricultural and Forest Meteorology* 73, 1-16.
- Kohsieck W. (2000) Water vapor cross-sensitivity of open path H₂O/CO₂ sensors, *Journal of Atmospheric and Oceanic Technology*, 17:299-311.
- 国立天文台編 (2005) 理科年表 2006, 1015pp, 丸善, 東京
- Komori D., Aoki M., Ishida T., Suzuki S., Satou T. and Kim W. (2004) Development of an air Sampling system for true eddy accumulation technique, *Journal of Agricultural Meteorology*, 60(4):263-272.
- Kondo J. and Sato T. (1982) The determination of the von Karman constant, *Journal of the Meteorological Society of Japan*, 60:461-471.
- Kormann R. and Meixner F. X. (2001) An analytical footprint model for non-neutral stratification, *Boundary-Layer Meteorology*, 99:207-224.
- Kristensen L. and Fitzjarrald D. R. (1984) The effect of line averaging on scalar flux measurements with a sonic anemometer near the surface, *Journal of Atmospheric and Oceanic Technology*, 1:138-146.
- Laubach J., Raschedorfer M., Kreilein H. and Gravenhorst G. (1994) Determination of heat and water vapour fluxes above a spruce forest by eddy correlation, *Agricultural and Forest Meteorology*, 71:373-401.

- Lee X. (1998) On micrometeorological observations of surface-air exchange over tall vegetation, Agricultural and Forest Meteorology 91:39-49.
- Lee X. and Massman, W. J. (2011) A perspective on thirty years of the Webb, Pearman and Leuning density corrections, Boundary-Layer Meteorology, 139:37-59.
- Lee X., Massman W. J. and Law B. E. (ed.) (2004) Handbook of Micrometeorology. A Guide for Surface Flux Measurements and Analysis, Kluwer Academic Publishers, Boston.
- Leuning R., and Judd M. J. (1996) The relative merits of open- and closed-path analyzers for measurement of eddy fluxes, Global Change Biology, 2:241-253.
- Leuning R. and King K. M. (1992) Comparison of eddy-covariance measurements of CO₂ fluxes by open- and closed-path CO₂ analysers, Boundary-Layer Meteorology, 59:297-311.
- Leuning R. and Moncrieff J. (1990) Eddy-covariance CO₂ flux measurements using Open- and Closed-path CO₂ analysers: Corrections for analyser water vapour sensitivity and damping of fluctuation in air sampling tubes, Boundary-Layer Meteorology, 53:63-76.
- Leuning R., Zegelin S. J., Jones K., Keith H. and Hughes D. (2008) Measurement of horizontal and vertical advection of CO₂ within a forest canopy, Agricultural Forest Meteorology, 148(11):1777-1797.
- LI-COR (2002) LI-7500 and direct solar radiation. LI-7500 Field Note #1, Publication Number: 75H102, LI-COR Inc.
- LI-COR (2003) Using CO₂ and H₂O Scrubbers with LI-COR Gas Analyzers. Publication Number: IRG4-101. LI-COR Inc.
- LI-COR (2004) LI-7500 CO₂/H₂O Analyzer Instruction Manual. LI-COR Inc.
- LI-COR (2011a) LI-7500A Open Path CO₂/H₂O Analyzer Instruction Manual. LI-COR Inc.
- LI-COR (2011b) Transitioning from an LI-7500 to an LI-7500A or LI-7200: A comparison, Technical Note # 130, 1-7.
- Liu H., Peters G. and Foken T. (2001) New equations for sonic temperature variance and buoyancy heat flux with an omnidirectional sonic anemometer, Boundary-Layer Meteorology, 100:459-468.
- Massman W. J. (2000) A simple method for estimating frequency response corrections for eddy covariance systems, Agricultural Forest Meteorology, 104:185-198.
- 松本真一 (2005) 太陽視赤緯と均時差計算に関する一考察, 日本建築学会東北支部研究報告集, 68:85-96.
- 松岡諒, 林陽生 (2008) 超音波風速温度計と熱電対温度計により求めた潜熱フラックスの特徴, 関東の農業気象 E-Journal, 5:11.
- Mauder M., Oncley S. P., Vogt R., Weidinger T., Ribeiro L., Bernhofer Ch., Foken T., Kohsiek W., De Bruin H. A. R. and Liu H. (2007) The energy balance experiment EBEX-2000. Part II: Intercomparison of eddy-covariance sensors and post-field data processing methods, Boundary-Layer Meteorology, 123:29-54.
- McCree K. J. (1972) Test of current definitions of photosynthetically active radiation against leaf photosynthesis data, Agricultural Meteorology, 10:443-453.
- Miyata A. and Mano M. (2002) Influence of subzero temperature on sensitivities of three open-path infrared gas analyzers, Proceedings of the 2nd International Workshop on Advanced Flux Network and Flux Evaluation, 3-4.

- Mkhabela, M.S., Amiro, B.D., Barr, A.G. Black, T.A., Hawthorne, I., Kidston, J., McCaughey, J.H., Orchansky, A.L., Nesic, Z., Sass, A., Shashkov, A. and Zha, T. (2009) Comparison of carbon dynamics and water use efficiency following fire and harvesting in Canadian boreal forests, *Agricultural and Forest Meteorology*, 149:783-794.
- 文字信貴 (2003) 亂れとフラックスの測定、植物と微気象-群落大気の乱れとフラックス-, 大阪公立大学共同出版会 (OMUP) 85-124.
- Moore C. J. (1986) Frequency response corrections for eddy correlation systems, *Boundary-Layer Meteorology*, 37:17-35.
- 村山昌平 (2001) 第 II 編第 1 章第 2 節 2.二酸化炭素 , 環境化学物質の最新計測技術 , リアライズ社 , 宮崎章監修 , 130-151.
- Nakai, T., Iwata, H. and Harazono, Y. (2011) Importance of mixing ratio for a long-term CO₂ flux measurement with a closed-path system, *Tellus*, 63B:302-308.
- Nakai T., van der Molen M. K., Gash J. H. C. and Kodama Y. (2006) Correction of sonic anemometer angle of attack errors, *Agricultural and Forest Meteorology*, 136:19-30.
- 中澤高清 (1982) 大気中の二酸化炭素濃度の変動, 地球化学, 16, 63-77.
- 日本工業規格 規格番号 JIS Z 8806:2001 (2001) 湿度測定方法, 財団法人日本規格協会.
- 大河原望, 高野松美 (2008)長波放射観測の世界基準への移行, 高層気象台彙報, 68:37-41.
- 大久保晋治郎 , 安立美奈子 , 小野圭介 , 本岡毅 , 西村涉 (2009) AsiaFlux Workshop 2009 -Integrating Cross-scale Ecosystem Knowledge: Bridge and Barriers- の報告 , 生物と気象 , 9:D-2 .
- 大谷義一 (1999a) 気温, In 森林立地調査法 - 森の環境を測る -. 森林立地調査法編集委員会 (ed.), 284pp, 博友社, 132-136.
- 大谷義一 (1999b) 日射 (短波放射) , In 森林立地調査法 - 森の環境を測る -. 森林立地調査法編集委員会 (ed.), 284pp, 博友社, 124-127.
- Ohtani Y., Mizoguchi Y., Watanabe T., Yasuda, Y., Okano M. (2001) Seasonal change of CO₂ flux above an evergreen needle leaf forest in temperate region, Fujiyoshida, Japan, CGER Report, CGER-M-011-2001:129-132.
- 大谷義一 , 溝口康子 , 安田幸生 , 渡辺力 (2005) 微気象学的方法による夜間の森林生態系純生産量 - 群落内 CO₂ 濃度変動の連続測定結果を用いた評価の試み - , 農業環境工学関連 7 学会 2005 年合同大会講演要旨集, 88.
- 岡田啓嗣 (2002) フットプリント解析 In フラックス観測の最近の進歩, 日本農業気象学会フラックス観測・評価研究部会編, 22-26.
- 小野圭介, 平田竜一, 間野正美, 宮田明, 三枝信子, 井上吉雄 (2007) オープンパス型とクローズドパス型の渦相関法による CO₂ フラックスの系統的差異と密度変動補正の影響. 農業気象, 63:139-155.
- Ono, K., Mano, M., Hirata, R. and Miyata, A. (2009) A validation study of the practical corrections for sensor heating at Open-path IRGA surfaces using computational fluid dynamics, Proceedings of AsiaFlux Workshop 2009 -Integrating Cross-scale Ecosystem Knowledge: Bridge and Barriers-, 92.
- 小野圭介, 宮田明, 齊藤誠, 原薦芳信 (2003) Open-path IRGA の校正と機種間比較. 日本気象学会春季大会予稿集, 83:339.

- Ono K., Miyata A. and Yamada T. (2008) Apparent downward CO₂ flux observed with open-path eddy covariance over a non-vegetated surface, *Theoretical and Applied Climatology*, 92:195-208.
- Pearman G. I. (1977) Further studies of the comparability of baseline atmospheric carbon dioxide measurements, *Tellus* 29:171-181.
- Pearman G. I., Garratt J. R. (1975) Errors in atmospheric CO₂ concentration measurements arising from the use of reference gas mixtures different in composition to the sample air, *Tellus* 27:62-65.
- Rannik U., Aubinet M., Kurbanmuradov O., Sabelfeld K. K., Markkanen T. and Vesela T. (2000) Footprint analysis for the measurements over heterogeneous forest, *Boundary-Layer Meteorology*, 97:137-166.
- Rinne H. J. I., Delany A. C., Greenberg J. P. and Guenther A. B. (2000) A true eddy accumulation system for trace gas fluxes using disjunct eddy sampling method, *Journal of Geophysical Research*, 105:24791-24798.
- 斎藤琢, 玉川一郎, 小泉博 (2007) 急斜面におけるフラックス計測と熱収支 - 純放射量と吹き上げ角の補正の検討 -, 水文・水資源学会 2007 年度研究発表要旨集, 118-119.
- Schmid H. P. (1997) Experimental design for flux measurements: matching scales of observations and fluxes, *Agricultural and Forest Meteorology*, 87(2-3):179-200.
- Schuepp P. H., Leclerc M. Y., MacPherson J. L. and Desjardins R. L. (1990) Footprint prediction of scalar fluxes from analytical solutions of the diffusion equation, *Boundary-Layer Meteorology*, 50:355-373.
- Serrano-Ortiz P., Kowalski A. S., Domingo F., Ruiz B. and Alados-Arboleda L. (2008) Consequences of uncertainties in CO₂ density for estimating Net Ecosystem CO₂ Exchange by open-path eddy covariance, *Boundary-Layer Meteorology*, 126:209-218.
- Shimizu T., Suzuki M. and Shimizu A. (1999) Examination of a correction procedure for the flow attenuation in orthogonal sonic anemometers, *Boundary-Layer Meteorology*, 93:227-236.
- Suyker A. E and Verma S. B. (1993) Eddy correlation measurement of CO₂ flux using a closed-path sensor: Theory and field tests against an open-path sensor, *Boundary-Layer Meteorology*, 64:391-407.
- Tsukamoto O. (1986) Dynamic response of the fine wire psychrometer for direct measurement of water vapor flux, *Journal of Atmospheric and Oceanic Technology*, 3:453-461.
- van der Molen M. K., Gash J. H. C. and Elbers J. A. (2004) Sonic anemometer (co)sine response and flux measurement. II. The effect of introducing an angle of attack dependent calibration, *Agricultural and Forest Meteorology*, 122:95-109.
- van Dijk A., Kohsieck W. and de Bruin H. A. R. (2003) Oxygen sensitivity of Krypton and Lyman-alpha hygrometers, *Journal of Atmospheric and Oceanic Technology*, 20:143-151.
- Watanabe T., Yamanoi K. and Yasuda Y. (2000) Testing of the bandpass eddy covariance method for a long-term measurement of water vapour flux over a forest, *Boundary-Layer Meteorology*, 96:473-491.
- Webb E. K., Pearman G. I. and Leuning R. (1980) Correction of flux measurements for density effects due to heat and water vapour transfer, *Quarterly Journal of the Royal Meteorological Society*, 106:85-100.
- Wieser A., Fiedler F. and Corsmeier U. (2001) The influence of the sensor design on wind measurements with sonic anemometer systems, *Journal of Atmospheric and Oceanic Technology*, 18:1585-1608.
- Wyngaard J. C. and Zhang S-F. (1985) Transducer-shadow effects on turbulence spectra measured by sonic anemometers, *Journal of Atmospheric and Oceanic Technology*, 2:548-558.

- Xu L-K., Matista A. A. and Hsiao T. C. (1999) A technique for measuring CO₂ and water vapor profiles within and above plant canopies over short periods, Agricultural and Forest Meteorology, 94:1-12.
- Yang B., Hanson P. J., Riggs J. S., Pallardy S. G., Heuer M., Hosman K. P., Meyers T. P., Wullschleger S. D. and Gu L. H. (2007) Biases of CO₂ storage in eddy flux measurements in a forest pertinent to vertical configurations of a profile system and CO₂ density averaging, Journal of Geophysical Research, 112(D20123).
- Yang P. C., Black T. A., Neumann H. H., Novak M. D. and Blanken P. D. (1999) Spatial and temporal variability of CO₂ concentration and flux in a boreal aspen forest, Journal of Geophysical Research, 104(D22):27653-27661.

シンボル一覧

A	アボガドロ数 ($6.023 \times 10^{23} \text{ mol}^{-1}$)
$APAR$	植物キャノピーが吸収する放射量 [$\mu\text{mol m}^{-2}\text{s}^{-1}$]
b	empirical coefficient in REA method
c_l	光速 ($2.9979 \times 10^8 \text{ ms}^{-1}$)
c_s	音速 [ms^{-1}]
c_t	本来の信号速度 [ms^{-1}]
C	セルシウス度, 摂氏 [$^{\circ}\text{C}$]
C_d	乾球温度 [$^{\circ}\text{C}$]
C_{dp}	露点温度 [$^{\circ}\text{C}$]
C_v	土壤の体積熱容量 [$\text{J m}^{-3} ^{\circ}\text{C}^{-1}$]
C_w	湿球温度 [$^{\circ}\text{C}$]
d	スパン長 [m]
dP	全圧と静圧との差(ベルヌーイの定理) [Pa]
$D_{2000.0}$	2000年1月1日0時の磁気偏角(2000.0年値) [$^{\circ}$]
e	水蒸気圧 [Pa]
e_d	飽差 [Pa]
e_s	飽和水蒸気圧 [Pa]
ΔE	サーモパイアルの出力電圧 [mV]
F_c	CO_2 フラックス [$\text{mg m}^{-2}\text{s}^{-1}$]
F_g	vertical flux of a trace gas [$\text{mg m}^{-2}\text{s}^{-1}$]
F_s	CO_2 storage change [$\text{mg m}^{-2}\text{s}^{-1}$]
F_E	PAR 波長域で積分した放射束密度 [W m^{-2}]
F_{E_λ}	単波長 λ の放射束密度 [W m^{-2}]
F_Q	PAR 波長域で積分した光量子束密度 [$\text{mol m}^{-2}\text{s}^{-1}$]
F_{Q_λ}	単波長 λ のモル光量子束密度 [$\text{mol m}^{-2}\text{s}^{-1}$]
h	プランク定数 ($6.626 \times 10^{-34} \text{ Js}$)
H	SAT で測定した顕熱フラックス [W m^{-2}]
H_{body}	機器表面で生成された顕熱フラックス [W m^{-2}]
H_{op}	オープンパスの測定パス内における顕熱フラックス [W m^{-2}]
ΔH	SAT で測定した顕熱フラックスとオープンパスの測定パス内の顕熱フラックスの差: $H - H_{op}$ [W m^{-2}]
J	1月1日からの積算日数(実数)たとえば1月1日12:00は $J = 0.5$
k	サーモパイアルの感度 [$\text{mV}(\text{W m}^{-2})^{-1}$]
k_d	ドーム係数
$L \uparrow$	上向き長波放射量 [W m^{-2}]

$L \downarrow$	下向き長波放射量 [Wm ⁻²]
m_c	CO ₂ 分子量 [kgmol ⁻¹]
m_d	乾燥空気の分子量[kg mol ⁻¹]
m_w	水蒸気の分子量[kg mol ⁻¹]
n	測定高度数
p	大気圧[Pa]
p_c	CO ₂ の分圧 [Pa]
$PAR \uparrow_{\text{above}}$	植物キャノピーより上で測定された反射 PAR [$\mu\text{mol m}^{-2}\text{s}^{-1}$]
$PAR \uparrow_{\text{below}}$	キャノピー下端での反射 PAR [$\mu\text{mol m}^{-2}\text{s}^{-1}$]
$PAR \downarrow_{\text{above}}$	植物キャノピーより上で測定された下向き PAR [$\mu\text{mol m}^{-2}\text{s}^{-1}$]
$PAR \downarrow_{\text{below}}$	キャノピー下端での下向きの PAR [$\mu\text{mol m}^{-2}\text{s}^{-1}$]
q	比湿 [kg kg ⁻¹]
Q	地中熱流量 [Wm ⁻²]
Q_b	最下層土層の下面における地中熱流量 [Wm ⁻²]
R_0	0°Cにおける抵抗値 [Ω]
R_{100}	100°Cにおける抵抗値 [Ω]
R_d	ドームを通過する長波放射 [Wm ⁻²]
R_{net}	正味放射量 [Wm ⁻²]
$S \uparrow$	上向き短波放射量(反射日射量) [Wm ⁻²]
$S \downarrow$	下向き短波放射量(全天日射量) [Wm ⁻²]
t	時間 [s]
t_1, t_2	各々のセンサ間の信号伝播時間 [s]
t_a	南中時刻 [h]
Δt_f	フラックス平均化時間 [s]
t_s	標準時における時刻 [h]
T	絶対温度 [K]
T_1	水の三重点温度 (273.16 K)
T_a	気温 [K]
T_b	センサボディの温度 [K]
T_d	ドームの温度 [K]
T_s	地温 [K]
T_v	音仮温度 [K]
T_{vt}	本来の音仮温度 [K]
u	風速(ベルヌーイの定理) [ms ⁻¹]
v_d	パスに平行な風速成分の速度 [ms ⁻¹]
v_n	パス間を垂直に横切る風(横風)の速度 [ms ⁻¹]
V_a	気相の体積 [m ³]
V_r	液相の体積 [m ³]

V_s	固相の体積 [m ³]
w	鉛直風速 [ms ⁻¹]
W_r	液相の質量 [g]
W_s	固相の質量 [g]
x	混合比 [kgkg ⁻¹]
x_s	飽和空気の混合比 [kgkg ⁻¹]
z	高度 [m]
z_d	各土層の厚さ [m]
z_f	フラックス測定高度 [m]
β	天頂角 [°]
γ	経度 [°]
γ_0	子午線 [°]
δ	太陽赤緯(日赤緯) [°]
ε	乾燥空気の分子量に対する水蒸気分子量の比
ζ_a	時角 [°]
ζ_s	太陽高度 [°]
η	飽和度 [m ³ m ⁻³]
θ	体積含水率 [m ³ m ⁻³]
θ_{sat}	飽和体積含水率 [m ³ m ⁻³]
Θ	含水比 [kgkg ⁻¹]
λ	波長 [m]
ρ	空気の密度(ベルヌーイの定理) [kgm ⁻³]
ρ_c	CO ₂ 密度[kgm ⁻³] [mgm ⁻³]
ρ_{cc}	CO ₂ 濃度 [μmolmol ⁻¹]
ρ_d	乾燥空気密度 [kgm ⁻³]
ρ_g	大気微量気体密度 [mgm ⁻³]
σ	Stefan-Boltzmann 定数 (5.67051×10 ⁻⁸ Wm ⁻² K ⁻⁴)
σ_w	w の標準偏差 [ms ⁻¹]
φ	緯度 [°]
Φ_a	絶対湿度[kgm ⁻³]
Φ_c	比較湿度(飽和度) [%]
Φ_p	相対湿度 [%]
X	ファーレンハイド(華氏) [F]
Ψ	マトリックポテンシャル [Pa]
ω	2π/365 または 2π/366
Ω	均時差 [h]
$a, c_1, c_2, j,$ k_1, k_2, k_3, α	定数