

FLUXES file data description

The file contains the eddy covariance measurements, including the quality check and filtering and the storage component, the footprint information, but without any gapfilling or partitioning (see the FLUXNET file for these data). The data are a continuous timeseries with resolution of 30 minutes.

The file name structure is ICOSETC_CC-###_FLUXES_VP.csv where CC-### is the official site code and VP is a two digits value that identifies the version of the processing.

The table here below describes the variables included and their units.

VARIABLE NAME	VARIABLE DESCRIPTION	UNIT
TIMESTAMP_START	Timestamp of start of averaging period (in local time without DST)	yyyymmddHHMM
TIMESTAMP_END	Timestamp of end of averaging period (in local time without DST)	yyyymmddHHMM
H_UNCLEANED	Sensible heat turbulent flux (no storage correction, uncleaned)	W m ⁻²
H	Sensible heat turbulent flux (no storage correction, cleaned)	W m ⁻²
H_DATA_FLAG	Flag for H (0: observed flux for which any quality control (QC) tests provided negligible evidences of error; 1: outlying flux rejected because at least one of the QC tests provided a moderate evidence of error; 2: flux removed because at least one of the QC test provided a severe evidence of error)	adimensional
LE_UNCLEANED	Latent heat turbulent flux (no storage correction, uncleaned)	W m ⁻²
LE	Latent heat turbulent flux (no storage correction, cleaned)	W m ⁻²
LE_DATA_FLAG	Flag for LE (0: observed flux for which any quality control (QC) tests provided negligible evidences of error; 1: outlying flux rejected because at least one of the QC tests provided a moderate evidence of error; 2: flux removed because at least one of the QC test provided a severe evidence of error)	adimensional
FC	Carbon Dioxide (CO ₂) turbulent flux (no storage correction)	μmolCO ₂ m ⁻² s ⁻¹
SC	Carbon Dioxide (CO ₂) storage flux	μmolCO ₂ m ⁻² s ⁻¹
NEE_UNCLEANED	Net Ecosystem Exchange (uncleaned)	μmolCO ₂ m ⁻² s ⁻¹
NEE	Net Ecosystem Exchange (cleaned)	μmolCO ₂ m ⁻² s ⁻¹

NEE_DATA_FLAG	Flag for NEE (i.e., 0: observed flux for which any quality control (QC) tests provided negligible evidences of error; 1: outlying flux rejected because at least one of the QC tests provided a moderate evidence of error; 2: flux removed because at least one of the QC test provided a severe evidence of error)	adimensional
H_OUTLYING_FLAG	Flag for H denoting outliers (0: no outlying flux; 1: outlying flux)	adimensional
LE_OUTLYING_FLAG	Flag for LE denoting outliers (0: no outlying flux; 1: outlying flux)	adimensional
NEE_OUTLYING_FLAG	Flag for NEE denoting outliers (0: no outlying flux; 1: outlying flux)	adimensional
H_FMR_STAT	Fraction of Missing Records in raw, high-frequency, data used for H flux estimation	%
H_FMR_FLAG	Flag for the FMR test for H (0: negligible evidences of error, IF $FMR < 5$; 1: moderate evidences of error, 1 IF $5 \leq FMR \leq 15$; 2: severe evidences of error, 2 IF $FMR > 15$)	adimensional
H_LGD_STAT	Longest Gap Duration in raw, high-frequency, data used for H flux estimation	seconds
H_LGD_FLAG	Flag for the LGD test for H (0: negligible evidences of error, IF $LGD < 90$; 1: moderate evidences of error, IF $90 \leq LGD \leq 180$; 2: severe evidences of error, IF $LGD > 180$)	adimensional
LE_FMR_STAT	Fraction of Missing Records in raw, high-frequency, data used for LE flux estimation	%
LE_FMR_FLAG	Flag for the FMR test for LE (0: negligible evidences of error, IF $FMR < 5$; 1, moderate evidences of error, IF $5 \leq FMR \leq 15$; 2, severe evidences of error, IF $FMR > 15$)	adimensional
LE_LGD_STAT	Longest Gap Duration in raw, high-frequency, data used for LE flux estimation	seconds
LE_LGD_FLAG	Flag for the LGD test for LE (0: negligible evidences of error, IF $LGD < 90$; 1: moderate evidences of error, IF $90 \leq LGD \leq 180$; 2: severe evidences of error, IF $LGD > 180$)	adimensional
FC_FMR_STAT	Fraction of Missing Records in raw, high-frequency, data used for FC flux estimation	%
FC_FMR_FLAG	Flag for the FMR test for FC (0: negligible evidences of error, IF $FMR < 5$; 1: moderate evidences of error, IF $5 \leq FMR \leq 15$; 2: severe evidences of error, IF $FMR > 15$)	adimensional
FC_LGD_STAT	Longest Gap Duration in raw, high-frequency, data used for FC flux estimation	seconds
FC_LGD_FLAG	Flag for the LGD test for FC (0: negligible evidences of error, IF $LGD < 90$; 1: moderate evidences of error, IF $90 \leq LGD \leq 180$; 2: severe evidences of error, IF $LGD > 180$)	adimensional
SA_DIAG_FLAG	Flag for Sonic Anemometer (SA) instrumental diagnostics (0: negligible evidences of error; 2: severe evidences of error)	adimensional

GA_DIAG_FLAG	Flag for gas analyzer (GA) instrumental diagnostics (0: negligible evidences of error; 2: severe evidences of error)	adimensional
WD	Wind direction	decimal degrees
WSECT_FLAG	Footprint quality flag indicating periods when wind was blowing from directions known to significantly affect the turbulent flow (0: negligible evidences of error; 2: severe evidences of error)	adimensional
H_LSR_STAT	Statistic of the Low Signal Resolution test for H	adimensional
H_LSR_FLAG	Flag for the LSR test for H (0: negligible evidences of error, IF $LSR_STAT > 0.995$; 1: moderate evidences of error, IF $0.99 \leq LSR_STAT \leq 0.995$; 2: severe evidences of error, IF $LSR_STAT < 0.99$)	adimensional
LE_LSR_STAT	Statistic of the Low Signal Resolution test for LE	adimensional
LE_LSR_FLAG	Flag for the LSR test for LE (0: negligible evidences of error, IF $LSR_STAT > 0.995$; 1: moderate evidences of error, IF $0.99 \leq LSR_STAT \leq 0.995$; 2: severe evidences of error, IF $LSR_STAT < 0.99$)	adimensional
FC_LSR_STAT	Statistic of the Low Signal Resolution test for FC	adimensional
FC_LSR_FLAG	Flag for the LSR test for FC (0: negligible evidences of error, IF $LSR_STAT > 0.995$; 1: moderate evidences of error, IF $0.99 \leq LSR_STAT \leq 0.995$; 2: severe evidences of error, IF $LSR_STAT < 0.99$)	adimensional
W_HF4_STAT	Statistic of the homogeneity test applied on vertical wind velocity fluctuations (percentage of data exceeding $\mu \pm 5\sigma$)	%
W_HF4_FLAG	Flag for the homogeneity test applied on vertical wind velocity fluctuations (0: negligible evidences of error, IF $HF4_STAT < 2$; 1: moderate evidences of error, IF $2 \leq HF4_STAT \leq 4$; 2: severe evidences of error, IF $HF4_STAT > 4$)	adimensional
W_HF1_STAT	Statistic of the homogeneity test applied on vertical wind velocity fluctuations (percentage of data exceeding $\mu \pm 10\sigma$)	%
W_HF1_FLAG	Flag for the homogeneity test applied on vertical wind velocity fluctuations (0: negligible evidences of error, IF $HF1_STAT < 0.5$; 1: moderate evidences of error, IF $0.5 \leq HF1_STAT \leq 1$; 2: severe evidences of error, IF $HF1_STAT > 1$)	adimensional
W_HD4_STAT	Statistic of the homogeneity test applied on differenced vertical wind velocity (percentage of data exceeding $\mu \pm 5\sigma$)	%
W_HD4_FLAG	Flag for the homogeneity test applied on differenced vertical wind velocity (0: negligible evidences of error, IF $HF4_STAT < 2$; 1: moderate evidences of error, IF $2 \leq HF4_STAT \leq 4$; 2: severe evidences of error, IF $HF4_STAT > 4$)	adimensional

W_HD1_STAT	Statistic of the homogeneity test applied on differenced vertical wind velocity (percentage of data exceeding $\mu \pm 10\sigma$)	%
W_HD1_FLAG	Flag for the homogeneity test applied on differenced vertical wind velocity (0: negligible evidences of error, IF $HF1_STAT < 0.5$; 1: moderate evidences of error, IF $0.5 \leq HF1_STAT \leq 1$; 2: severe evidences of error, IF $HF1_STAT > 1$)	adimensional
T_SONIC_HF4_STAT	Statistic of the homogeneity test applied on sonic temperature fluctuations (percentage of data exceeding $\pm 5\sigma$)	%
T_SONIC_HF4_FLAG	Flag for the homogeneity test applied on sonic temperature fluctuations (0: negligible evidences of error, IF $HF4_STAT < 2$; 1: moderate evidences of error, IF $2 \leq HF4_STAT \leq 4$; 2: severe evidences of error, IF $HF4_STAT > 4$)	adimensional
T_SONIC_HF1_STAT	Statistic of the homogeneity test applied on sonic temperature fluctuations (percentage of data exceeding $\pm 10\sigma$)	%
T_SONIC_HF1_FLAG	Flag for the homogeneity test applied on sonic temperature fluctuations (0: negligible evidences of error, IF $HF1_STAT < 0.5$; 1: moderate evidences of error, IF $0.5 \leq HF1_STAT \leq 1$; 2: severe evidences of error, IF $HF1_STAT > 1$)	adimensional
T_SONIC_HD4_STAT	Statistic of the homogeneity test applied on differenced sonic temperature (percentage of data exceeding $\pm 5\sigma$)	%
T_SONIC_HD4_FLAG	Flag for the homogeneity test applied on differenced sonic temperature (0: negligible evidences of error, IF $HF4_STAT < 2$; 1: moderate evidences of error, IF $2 \leq HF4_STAT \leq 4$; 2: severe evidences of error, IF $HF4_STAT > 4$)	adimensional
T_SONIC_HD1_STAT	Statistic of the homogeneity test applied on differenced sonic temperature (percentage of data exceeding $\pm 10\sigma$)	%
T_SONIC_HD1_FLAG	Flag for the homogeneity test applied on differenced sonic temperature (0: negligible evidences of error, IF $HF1_STAT < 0.5$; 1: moderate evidences of error, IF $0.5 \leq HF1_STAT \leq 1$; 2: severe evidences of error, IF $HF1_STAT > 1$)	adimensional
H2O_HF4_STAT	Statistic of the homogeneity test applied on water vapor fluctuations (percentage of data exceeding $\pm 5\sigma$)	%
H2O_HF4_FLAG	Flag for the homogeneity test applied on water vapor fluctuations (0: negligible evidences of error, IF $HF4_STAT < 2$; 1: moderate evidences of error, IF $2 \leq HF4_STAT \leq 4$; 2: severe evidences of error, IF $HF4_STAT > 4$)	adimensional

H2O_HF1_STAT	Statistic of the homogeneity test applied on water vapor fluctuations (percentage of data exceeding $\pm 10\sigma$)	%
H2O_HF1_FLAG	Flag for the homogeneity test applied on water vapor fluctuations (0: negligible evidences of error, IF $HF1_STAT < 0.5$; 1: moderate evidences of error, IF $0.5 \leq HF1_STAT \leq 1$; 2: severe evidences of error, IF $HF1_STAT > 1$)	adimensional
H2O_HD4_STAT	Statistic of the homogeneity test applied on differenced water vapor (percentage of data exceeding $\pm 5\sigma$)	%
H2O_HD4_FLAG	Flag for the homogeneity test applied on differenced water vapor (0: negligible evidences of error, IF $HF4_STAT < 2$; 1: moderate evidences of error, IF $2 \leq HF4_STAT \leq 4$; 2: severe evidences of error, IF $HF4_STAT > 4$)	adimensional
H2O_HD1_STAT	Statistic of the homogeneity test applied on differenced water vapor (percentage of data exceeding $\pm 10\sigma$)	%
H2O_HD1_FLAG	Flag for the homogeneity test applied on differenced water vapor (0: negligible evidences of error, IF $HF1_STAT < 0.5$; 1: moderate evidences of error, IF $0.5 \leq HF1_STAT \leq 1$; 2: severe evidences of error, IF $HF1_STAT > 1$)	adimensional
CO2_HF4_STAT	Statistic of the homogeneity test applied on carbon dioxide fluctuations (percentage of data exceeding $\pm 5\sigma$)	%
CO2_HF4_FLAG	Flag for the homogeneity test applied on carbon dioxide fluctuations (0: negligible evidences of error, IF $HF4_STAT < 2$; 1: moderate evidences of error, IF $2 \leq HF4_STAT \leq 4$; 2: severe evidences of error, IF $HF4_STAT > 4$)	adimensional
CO2_HF1_STAT	Statistic of the homogeneity test applied on carbon dioxide fluctuations (percentage of data exceeding $\pm 10\sigma$)	%
CO2_HF1_FLAG	Flag for the homogeneity test applied on carbon dioxide fluctuations (0: negligible evidences of error, IF $HF1_STAT < 0.5$; 1: moderate evidences of error, IF $0.5 \leq HF1_STAT \leq 1$; 2: severe evidences of error, IF $HF1_STAT > 1$)	adimensional
CO2_HD4_STAT	Statistic of the homogeneity test applied on differenced carbon dioxide (percentage of data exceeding $\pm 5\sigma$)	%
CO2_HD4_FLAG	Flag for the homogeneity test applied on differenced carbon dioxide (0: negligible evidences of error, IF $HF4_STAT < 2$; 1: moderate evidences of error, IF $2 \leq HF4_STAT \leq 4$; 2: severe evidences of error, IF $HF4_STAT > 4$)	adimensional
CO2_HD1_STAT	Statistic of the homogeneity test applied on differenced carbon dioxide (percentage of data exceeding $\pm 10\sigma$)	%

CO2_HD1_FLAG	Flag for the homogeneity test applied on differenced carbon dioxide (0: negligible evidences of error, IF $HF1_STAT < 0.5$; 1: moderate evidences of error, IF $0.5 \leq HF1_STAT \leq 1$; 2: severe evidences of error, IF $HF1_STAT > 1$)	adimensional
W_KID_STAT	Kurtosis Index of Differenced vertical wind velocity	adimensional
W_KID_FLAG	Flag for the W_KID_STAT (0: negligible evidences of error, IF $KID_STAT < 30$; 1: moderate evidences of error, IF $30 \leq KID_STAT \leq 50$; 2: severe evidences of error, IF $KID_STAT > 50$)	adimensional
T_SONIC_KID_STAT	Kurtosis Index of Differenced sonic temperature	adimensional
T_SONIC_KID_FLAG	Flag for the T_SONIC_KID_STAT (0: negligible evidences of error, IF $KID_STAT < 30$; 1: moderate evidences of error, IF $30 \leq KID_STAT \leq 50$; 2: severe evidences of error, IF $KID_STAT > 50$)	adimensional
H2O_KID_STAT	Kurtosis Index of Differenced water vapor	adimensional
H2O_KID_FLAG	Flag for the H2O_KID_STAT (0: negligible evidences of error, IF $KID_STAT < 30$; 1: moderate evidences of error, IF $30 \leq KID_STAT \leq 50$; 2: severe evidences of error, IF $KID_STAT > 50$)	adimensional
CO2_KID_STAT	Kurtosis Index of Differenced carbon dioxide	adimensional
CO2_KID_FLAG	Flag for the CO2_KID_STAT (0: negligible evidences of error, IF $KID_STAT < 30$; 1: moderate evidences of error, IF $30 \leq KID_STAT \leq 50$; 2: severe evidences of error, IF $KID_STAT > 50$)	adimensional
ITC_STAT	Statistic of the Integral Turbulence Characteristics test (Foken and Wichura, 1996)	%
ITC_FLAG	Flag for the ITC test (0: negligible evidences of error, IF $ITC_STAT < 30$; 1: moderate evidences of error, IF $30 \leq ITC_STAT \leq 50$; 2: severe evidences of error, IF $ITC_STAT > 50$)	adimensional
H_SCF_STAT	Spectral correction factor for H	adimensional
H_SCF_FLAG	Flag of the H_SCF_STAT (0: negligible evidences of error, IF $0.8 \leq SCF_STAT \leq 1.25$; 1: moderate evidences of error, IF $0.5 \leq SCF_STAT < 0.8$ OR $1.25 < SCF_STAT \leq 2$; 2: severe evidences of error, IF $SCF_STAT < 0.5$ OR $SCF_STAT > 2$)	adimensional
LE_SCF_STAT	Spectral correction factor for LE	adimensional
LE_SCF_FLAG	Flag of the LE_SCF_STAT (0: negligible evidences of error, IF $0.8 \leq SCF_STAT \leq 1.25$; 1: moderate evidences of error, IF $0.5 \leq SCF_STAT < 0.8$ OR $1.25 < SCF_STAT \leq 2$; 2: severe evidences of error, IF $SCF_STAT < 0.5$ OR $SCF_STAT > 2$)	adimensional
FC_SCF_STAT	Spectral correction factor for NEE	adimensional
FC_SCF_FLAG	Flag of the NEE_SCF_STAT (0: negligible evidences of error, IF $0.8 \leq SCF_STAT \leq 1.25$; 1: moderate evidences of error, IF $0.5 \leq SCF_STAT < 0.8$ OR $1.25 < SCF_STAT \leq 2$; 2:	adimensional

	severe evidences of error, IF SCF_STAT<0.5 OR SCF_STAT>2)	
H_M98_STAT	Statistic of the nonstationarity ratio test by Mahrt (1998) for H	adimensional
H_M98_FLAG	Flag of the H_M98_STAT (0: negligible evidences of error, IF M_98_STAT<2; 1: moderate evidences of error, IF 2≤M98_STAT≤3; 2: severe evidences of error, IF M98_STAT>3)	adimensional
LE_M98_STAT	Statistic of the nonstationarity ratio test by Mahrt (1998) for LE	adimensional
LE_M98_FLAG	Flag of the LE_M98_STAT (0: negligible evidences of error, IF M_98_STAT<2; 1: moderate evidences of error, IF 2≤M98_STAT≤3; 2: severe evidences of error, IF M98_STAT>3)	adimensional
FC_M98_STAT	Statistic of the nonstationarity ratio test by Mahrt (1998) for FC	adimensional
FC_M98_FLAG	Flag of the FC_M98_STAT (0: negligible evidences of error, IF M_98_STAT<2; 1: moderate evidences of error, IF 2≤M98_STAT≤3; 2: severe evidences of error, IF M98_STAT>3)	adimensional
H_SSITC_TEST	Quality flagging for H according to classification scheme by Foken et al (2004) and based on the combination of the results of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (0: high quality; 1: intermediate quality; 2: low quality). Currently not used in the data cleaning procedure.	adimensional
LE_SSITC_TEST	Quality flagging for LE according to classification scheme by Foken et al (2004) and based on the combination of the results of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (0: high quality; 1: intermediate quality; 2: low quality). Currently not used in the data cleaning procedure.	adimensional
NEE_SSITC_TEST	Quality flagging for NEE according to classification scheme by Foken et al (2004) and based on the combination of the results of Steady State and Integral Turbulence Characteristics tests by Foken and Wichura (1996) (0: high quality; 1: intermediate quality; 2: low quality). Currently not used in the data cleaning procedure.	adimensional
CO2	Carbon Dioxide (CO2) in mole fraction of wet air	μmolCO2 mol-1
CO2_SIGMA	Standard deviation of carbon dioxide in mole fraction of wet air	μmolCO2 mol-1
H2O	Water (H2O) vapor mole fraction	mmolH2O mol-1
H2O_SIGMA	Standard deviation of water vapor mole fraction	mmolH2O mol-1
T_SONIC	Sonic temperature	deg C
T_SONIC_SIGMA	Standard deviation of sonic temperature	deg C

WS	Wind speed	m s ⁻¹
USTAR	Friction velocity	m s ⁻¹
W_SIGMA	Standard deviation of vertical velocity fluctuations	m s ⁻¹
U_SIGMA	Standard deviation of lateral velocity fluctuations (towards main-wind direction after coordinates rotation)	m s ⁻¹
V_SIGMA	Standard deviation of lateral velocity fluctuations (cross main-wind direction after coordinates rotation)	m s ⁻¹
ZL	Monin-Obukhov stability parameter	adimensional
MO_LENGTH	Monin-Obukhov length	m
PBLH	Planetary boundary layer height	m
FETCH_MAX	Distance at which cross-wind integrated footprint contribution is maximum	m
FETCH_70	Distance at which cross-wind integrated footprint cumulative probability is 70%	m
FETCH_80	Distance at which cross-wind integrated footprint cumulative probability is 80%	m
FETCH_90	Distance at which cross-wind integrated footprint cumulative probability is 90%	m
FOOTPRINT_FLAG	Footprint flag (0, 1, 2, 3). 0 = data used for footprint, 1 = 2D footprint model flag error, 2 = not all 2D footprint model isoplethes within specified domain, 3 = data removed because of invalid conditions for footprint model	adimensional
FOOTPRINT_80_SURF	2D footprint 80% isoplethe area	m ²
FOOTPRINT_TA_SURF	Area of footprint/target area intersection	m ²
FOOTPRINT_TA_CONTR	Cumulative footprint contribution of the footprint/target area intersection	m ² m ⁻² , %