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Table 1: Measurements of dynamics and thermodynamics in the boundary layer and above

Site	Provider	Sensor annotation	Instrument provider/ manufacturer	Type	Measured parameter	Derived parameter	Derivation method	Vertical resolution in m vertical coverage in m AZ	Observation strategy/ time resolution/ time resolution in file	DOI	Data repository	Filename	
Ile-Ife	OAU	Sodar	Metek	PCS 2000	u, v	ws, wd	Soda2000_V3.1.2.16	20-30-610	continuous/ 600 s/ 600 s	10.6090/DACCWA/1702	OAU_SODAR_Ife-Ife	ile_Ife_OAU_Sodar_YYYYMMDD.nc	
		Tethered radiosonde	Dras	GS-E, DFMD9	T, RH	P, sl, sh, D, theta, Tu	Grawest 5.03.03.13	110-600	discontinuous, every 3 hrs during IOP (between 1800 UTC on Day0 1700 UTC on Day 1) 1 s/ 1 s		OAU_TetheredRadiosonde_Ife-Ife	ile_Ife_OAU_Tethered_Radiosonde_YYYYMMDD_21.nc	
Kumasi	NCAS	Sodar	Scintec AG	MFAS	u, v, w, bac	sl, wd, shL, shB, shC, shD, shE, shF, shG, shH, shI, shJ, shK, shL, shM, shN, shO, shP, shQ, shR, shS, shT, shU, shV, shW, shX, shY, shZ	FASTRUN v2.19	10-0-970	continuous/ 600 s/ 600 s	10.6090/DACCWA/1863	Sodar - Kumasi	ncas-sodar-2-kumasi_YYYYMMDD_backscatter-winds_v2.1.nc	
		Microwave radiometer	Radiometer Physics	HATPRO-G4	BT at 14 frequencies in the microwave range, 48-adj	Chiappi(BT)	TPB_NN_RPQ_v00101 - developed by RPO Radiometer Physics	continuous/ 2 s/ 2 s	height depend 10-300/ 0-10000		continuous/ 2 s/ 2 s	Scanning Microwave Radiometer - Brightness Temperature Profiles - Kumasi (BT)	ncas-scanning-radiometer-1-kumasi_YYYYMMDD_brightness-temperature_profiles_v1.2.nc
						TBL Chiappi (TBL)		continuous/ 2 s/ 2 s			Scanning Microwave Radiometer - Boundary Layer Temperature Profiles - Kumasi (TBL)	ncas-scanning-radiometer-1-kumasi_YYYYMMDD_boundary-layer-temperature_profiles_v1.2.nc	
						RH, sh, Chiappi (RH, sh)		continuous/ 2 s/ 2 s			Scanning Microwave Radiometer - Stability Indices - Kumasi	ncas-scanning-radiometer-1-kumasi_YYYYMMDD_stability-indices_v1.2.nc	
						TT, Chiappi (TT)		continuous/ 2 s/ 2 s			Scanning Microwave Radiometer - Tropospheric Temperature Profiles - Kumasi (TT)	ncas-scanning-radiometer-1-kumasi_YYYYMMDD_tropospheric-temperature_profiles_v1.2.nc	
						IRW, LWP, Chiappi (IRW, LWP)		continuous/ 2 s/ 2 s			Scanning Microwave Radiometer - WVLWP - Kumasi (IRW, LWP)	ncas-scanning-radiometer-1-kumasi_YYYYMMDD_wvlwp_v1.2.nc	
SI, Chiappi (SI)	continuous/ 2 s/ 2 s	Scanning Microwave Radiometer - Moisture Profiles - Kumasi (SI)	ncas-scanning-radiometer-1-kumasi_YYYYMMDD_moisture_profiles_v1.2.nc										
Washer station	Davis Instruments	Vantage Pro 2 Wireless	T, RH, P, ws, wd, prec, RR, LWDR, LU-index	SWDR, Chiappi T, RH, P, ws, wd, prec, RR, LWDR, SWDR				continuous/ 2 s/ 2 s		Scanning Microwave Radiometer - Surface Met - Kumasi	ncas-scanning-radiometer-1-kumasi_YYYYMMDD_surface-met_v1.2.nc		
Normal radiosonde	Veisala	DigCoro Sounding System with RRS200P or RRS410G	T, RH, P, ws, wd, sl, P (RRS200P)	P (RRS410G), Chiappi (T, RH, ws, wd)	MW41	-4/ (0-20 000)	discontinuous, every 3 hours during the campaign at 0600 UTC. Fine sounding during IOP day every 6 hours (from 1800 UTC on day 0 to 1800 UTC on day 1) 1 s/ 1 s			Radiosonde - Kumasi	ncas-radiosonde-2-kumasi_YYYYMMDD-therm_profiles_v1.2.nc		
Frequent radiosonde	Sparv Embedded	Windsond SH-R	T, RH, P, ws, wd	Chiappi T, RH, P, ws, wd	Windsond Receiver Application 2.11	-8/ 0-650	discontinuous, every 3 hours during IOP from 0900 UTC on day 0-1 to 0900 UTC on day 1) 3 s/ 3 s			Rapid Sonda - Kumasi	ncas-rapidsonde-2-kumasi_YYYYMMDD-therm_sonde_v2.nc		
KIT		Sodar	Scintec AG	MFAS	u, v, bac	ws, wd	APR14 1.45	10/ 30-600	continuous/ 1800 s/ 1800 s	10.6090/DACCWA/1659	KIT_Sodar_Save	save_kit_sodar_YYYYMMDD.nc	
		Wind lidar	Lockheed Martin	Wind Tracer HYB	sls, sls, bac	sls, sls, rv	MDAS Version 1.13.C.03	Vertical start: 40/ 375-5470 Scanning Resolution along beam: 75 Minimum range along beam: 390 - 9900	continuous/ 500 Hz/ 1 (vertical start), 0.1 s (scanning)			Save_KIT_DOPPLERLIDAR_BS_YYYYMMDD.nc	save_kit_dopplerlidar_bs_YYYYMMDD.nc
		Wind lidar	Leosphere	WINDCUBES	w, CHR		WINDCUB_LR - 1.1.9	20/ 40-650	continuous/ -/ 6-4 s			Save_KIT_DOPPLERLIDAR_SNR_YYYYMMDD.nc	save_kit_dopplerlidar_snr_YYYYMMDD.nc
		Microwave radiometer	Radiometer Physics	HATPRO-G4	BT at 14 frequencies in the microwave range BT at 2 frequencies in the infrared range, sls, wd	Chiappi(BT) HJA, Chiappi(HJA) TT, Chiappi (TT) TBL, Chiappi(TBL) LWC, Chiappi(LWC) IRW, Chiappi(IRW)	Software mepro-v04 provided by University of Cologne (Löhnert and Chavel 2002; Löhnert et al. 2005). Retrievals based on radiosonde profiles at Adige.	height depend 50-500/ 0-10000	continuous, combination of vertical stare and scanning mode -/ 4 s TBL, 900s			Save_KIT_MWR_TB_YYYYMMDD.nc	save_kit_mwr_tb_YYYYMMDD.nc
Sask	LPS	LHF wind profiler	Degrease Horizon	PCL130	ASPT, SW, SKEW, noise along each beam, rv	u, v, CN2	LPSLA algorithm	High acquisition mode: 150 m/ 150-4000 m Low acquisition mode: 75 m/ 150-3500 m	continuous -/ 120 s/ 120 s	10.6090/DACCWA/1618	LPS_LHF_WindProfiler_Data_Save	daccwa_lhf_high_mode_v1.nc daccwa_lhf_low_mode_v1.nc	
		RPAS OVLTA	Campbell Scientific	SHT75	T, RH, GPS coordinates, IMU aircraft position, pressure differentials on radome, static pressure	theta, ws, wd, u, v	LPSLA algorithm	-3 m/ 0-1000 m Profiles were generally flown below 600 m	daytime discontinuous -/ 2 s			LPS_OU1_RPAS_Save	daccwa_ovl_YYYYMMDD-therm_up_v01.nc (locat) daccwa_ovl_YYYYMMDD-therm_down_v01.nc (locat)
		Normal radiosonde	Modem	M10 or MK20C	T, RH, GPS coordinates	sl, ws, wd, u, v, P	Modem software	-5 m/ 0-20 000 m	discontinuous, every day during the campaign at 0600 UTC. Fine sounding during IOP day every 3 h (from 1800 UTC on day 0 to 1200 UTC on day 1) -/ -			LPS_Radiosoundings_Save	LAYYYYYMMDDtherm.nc
		Frequent radiosonde	Modem	M10	T, RH, GPS coordinates	sl, ws, wd, u, v, P	Modem software	-5 m/ 0-1500 m	discontinuous, 1 and 1.5 h on IOP day -/ -			LPS_Frequent_Radiosoundings_Save	LAYYYYYMMDDtherm.nc
IFF	ALADINA	Veisala	HMP10	slow T, slow RH	theta, Pres, D					10.6090/BA/0366/DACCWA/1701	IFF_ALADINA-RPAS_Save	iff1_YYYYMMDD_record_1/therm/therm_v2.nc	
		Innovative Sensor Technology	Rapid P14	fast RH									
		Amey	TSY501	slow T									
		TU Braunschweig	FinWire and sea-hole probe	fast T, P	ws, wd, u, v, w, sls, theta, beta								
		IMAR GmbH	imWRU	WGSN coordinates, speed vector in earth fixed coordinate system, pitch, roll, yaw, track angle, Mach number, true airspeed									
		EKO Instruments	ML-01	SWDR, SWLR									

- Abbreviations**
- alpha Angle of attack
 - ASPT Power aspect ratio
 - azi Azimuth
 - beta Angle, side slip
 - ba Backscatter beam
 - bac Backscatter
 - BT Brightness temperature
 - CN2 Structure coefficient of the air refractive index
 - CNR Carrier to noise ratio
 - D Air density
 - D Air density
 - D Seaion
 - sls Absolute humidity
 - IMU Inertial measurement unit
 - IRW Integrated water vapour
 - LWC Liquid water content
 - LWCR Long-wave downwelling radiation
 - LWP Liquid water path
 - P Air pressure
 - prec Total amount of precipitation
 - Chiappi(CO2) Quality flag of a specific parameter
 - RH Relative humidity
 - RR Rain rate
 - rv wind radial velocity or Doppler velocity
 - Rsect Specific gas constant
 - sh Specific humidity
 - sl Atmospheric stability indices
 - slw vertical_velocity_slowness
 - SNR Signal to noise ratio
 - stdk Standard deviation of a specific parameter
 - SW Vertical velocity doppler Spectral width
 - SWR Short-wave downwelling radiation
 - SWCR Short-wave upwelling radiation
 - T Air temperature
 - TBL Temperature profile from boundary layer scan
 - tsl Sea ion temperature
 - theta Potential temperature
 - theta Temperature profile from full
 - TT troposphere scan
 - Tv Virtual temperature
 - u Eastward wind component
 - u Northward wind component
 - w Vertical wind speed
 - wd Wind direction
 - ws Wind speed

Table 2: Measurements of cloud characteristics, aerosol and precipitation

Site	Provider	Sensor annotation	Instrument provider/ manufacturer	Type	Measured parameter	Derived parameter	Derivation method	Vertical resolution in m/ vertical coverage in m AGL	Observation strategy/ time resolution/ time resolution in file	DOI	Data repository	Filename
Ile-Ile	OAU	Hand-held infrared thermometer	Optron	IT330 274	CBT	CT		-	discontinuous/ 3 h/ 3 h	10.6096/ DACCIIWA.1702	OAU_CBT_Ile-Ile	oau-cloud-base-temp-june_july_2016.csv
		Photometer	TENUM	Callioo Sun Photometer	T, P, raw465, raw540, raw619, etc	ae4465, ae0540, ae0619		Callioo v2.5	discontinuous/ < 10 s/ < 10 s		OAU_AOD_Ile-Ile	Ile_Ile_OAU_AOD_YYYYMMDD.nc
Kumasi	NCAS	Rain radar	Metek	MRRR 2	Z	DSD, Offlags	Metek MRR Control 6.0.0.6	35/ 35-1085	continuous/ 60 s/ 60 s	10.6096/ DACCIIWA.1693	Concentration Profiles - Kumasi	ncas-mrr-1_kumasi_YYYYMMDD_size-concentration-spectra_v1.2.nc
					Z	RR, LWC, Zv, PIA	Metek MRR Control 6.0.0.6				Rain and Reflectivity Profiles - Kumasi	ncas-mrr-1_kumasi_YYYYMMDD_rain-lwc-velocity-reflectivity_v1.2.nc
		Cellometer	Campbell Scientific	CS135	Aerosol bsc	-	-	5/ 10- 250	continuous/ 10 s/ 10 s		Cellometer - Kumasi	ncas-cell-1_kumasi_YYYYMMDD_backscatter_v1.2.nc
		Cloud camera	Ycam	Protect Outdoor Camera 1080	Visible and Infrared sky image	-	-	Measuring height: 2 m AGL	continuous/ 1 s/ 1 s		Camera - Kumasi	YYYY-MM-DD_hh.avi
KIT	Save	Rain radar	Metek	MRRR 2	Z	Zv, RR, LWC, MPp, Nd, PIA	proprietary software by Uli Blahak	200/ 200-6000	continuous/ 60 s/ 60 s	10.6096/ DACCIIWA.1686	KIT_MRR_Save	int01_YYYYMMDD.dat.gz
			Selex International	Meteor50 DX	Z, rv, sw, ZDR, uZ, KDp, PhIDP, rhoHV, uPhIDP, etc, azi		Rainbow 5.36.5	Horizontal radius of volume scan: 100 km	continuous volume scan/ -/ 300 s		KIT_X-Band_Radar_Save	YYYYMMDD.tar.gz
		Cloud radar	Metek	MIRA36-S	VELq, Zg, LDR, RMSq, etc, azi	VELcl, Z	DL software by METEK 33th conference on radar meteorology, 2007	30/ 150-15000	continuous, combination of vertical stare and scanning mode/ -/ 10 s (vertical stare), 1 s (scanning)		KIT_CloudRadar Data-Save	Save_KIT_CR_YYYYMMDD_v1.nc
		Distrometer	Ott	Joss-Waldvogel	DSD	Z, RR	Measuring height: 0.1 m	15/ 0-15000	continuous/ -/ 60 s		KIT_Distrometer_Save	Save_KIT_JWD_YYYYMMDD.nc
		Cellometer	Luftt	CHM15k Nimbus	beta_raw (normalized range corrected signal)	CBH, CD	Luftt 12.12.1 2.13 0.733	15/ 0-15000	continuous/ -/ 60 s		KIT_CellometerData_Save	Save_KIT_CM_YYYYMMDD.nc
Save	Photometer	Cimel	CE316	only derived data available	ADD, PW, AP	AERONET Version 3 for AOD and Attenuation Retrievals Version 2, quality level 1.5	Sensor height: 1 m AGL	continuous/ 1800 s/ 1800 s	10.6096/ DACCIIWA.1659	KIT_SunPhotometer_Save	SAVE_KIT_SUN_AODPWAP.nc	
					RI	SAVE_KIT_SUN_SIZ.nc						
UPS	Cloud camera	Mobotix	S15	Visible and infrared sky image	images	-	Sensor height: 7.4 m AGL	Horizontal full sky visible images 43 by 32 degree aperture for IR images	10.6096/ DACCIIWA.1618	UPS_Cloud_camera - Save	mobotix_gobe_inrab_YYYYMMDD.tar.gz	
											IFF	RPAS ALADINA
IFF	RPAS ALADINA	Microsoeth	AE-51	BC	BC low pass filtered	-	-	-	-	-	-	

Abbreviations	Long name
Af	Asymmetry factor
AOD	Aerosol optical depth
AOD_C	AOD, coarse mode
AOD_F	AOD, fine mode
AOD_T	AOD, total
aeXXXX	Aerosol optical thickness in a specific wave length range
AP	Angstrom exponent
azi	Azimuth angle
BC	Black carbon concentration
beta_raw	normalized range corrected signal
bsc	Backscatter, aerosol
CBH	Cloud base height
CBT	Cloud base temperature
CD	Cloud depth
CT	Cloud type
DSD	Precipitation, drop size distribution
ele	Elevation angle
KDP	Specific differential phase
LDR	Linear de-polarization ratio
LWC	Liquid water content
MPp	Marshall Palmer fit parameters
Nd	Total number of drops per cubic meter
P	Air pressure
PhIDP	Differential propagation phase (PhIDP)
PIA	Path integrated attenuation
PW	Precipitable water
Qflag	General quality flags
Qflag(XXX)	Quality flag of a specific parameter
rawXXX	Aerosol, raw data in a specific wave length range
RH	Relative humidity
rhoHV	Co-polar correlation coefficient
RI	Refractive index
RMSq	Peak width
RR	Rain rate
rv	Radial velocity
SSA	Single scattering albedo
sw	Spectral width
T	Air temperature
uPhIDP	Uncorrected differential propagation phase
uZ	Uncorrected reflectivity
VELcl	Velocity of cloud drops and ice particles
VELq	Velocity of all particles (globab)
Z	Reflectivity
ZDR	Differential reflectivity
Zv	Equivalent radar reflectivity of all targets
Zw	Reflectivity weighted velocity

Table 3: Near-surface measurements

Site	Operator	Sensor resolution	Instrument provider/ manufacturer	Type	Measured parameter	Derived parameter	Measuring heights in m AGL	Observation strategy/ time resolution time resolution in file	DOI	Data repository	Filename		
Ile-Ile	OAU	Pressure sensor	Campbell Scientific	CSAT3		P	2.1	continuous/ 0.1 s / 1800 s	10.6096/ DACCIWA-1702	OAU_MetObs_Ile-Ile	Ile_Ile_OAU_MetObs_YYYYMMDD.nc		
		Temperature/humidity probe	Campbell Scientific/Vaisala	HMP 60	T, RH	sh, D	2.1						
		Anemometer	Vector Instruments	A101 ML	ws		1.71						
		Windvane	Vector Instruments	W02P	wd		1.71	continuous/ 10 s / 1800 s					
		Soil temperature probe	Campbell Scientific	T108	ST		0.02, -0.05, 0.10, 0.30, 0.50						
		Soil moisture	Campbell Scientific	CS616	SM		-0.05						
		Net radiometer	Campbell Scientific/Hukseflux	NR01		Tsur	1.65	continuous/ 1800 s / 1800 s					
		Rain gauge	Teoss Instruments	TE525	prec		0.2						
		Net radiometer	Scientific/Hukseflux	NR01	SWDR, SWUR, LWDR, LWUR	Tsur, Qnet	1.65						
		Soil heat flux plates	Hukseflux	HFP01	shf		-0.02	continuous/ 10 s / 60 s					
		Soil moisture	Campbell Scientific	CS616									
		Soil temperature probe	Campbell Scientific	T108	ST		0.02, -0.05, 0.10, 0.30, 0.50						
Temperature/humidity probe	Campbell Scientific	HMP60	T, RH		1.14, 3.3, 6.3, 12.1	continuous/ 10 s / 60 s							
Anemometer	Vector Instruments	A101 ML	ws		1.14, 1.88, 3.3, 6.3, 12.1								
Kumasi	NCAS	Soil heat flux plates	Hukseflux	HFP01SC (v6)	shf	Qflag(shf)		continuous/ 300 s / 300 s	10.6096/ DACCIWA-1693	Energy Balance 1 - Soil - Kumasi	ncas-energy-balance-1_kumasi_YYYYMMDD_soil_v1.2.nc		
		Soil temperature probe	Campbell Scientific	107 (v6)	ST	Qflag(ST)	0.08						
		Soil moisture/Soil matrix potential	Campbell Scientific	253 (v6)	mp	Qflag(mp)							
		Net radiometer	Hukseflux	NR01	SWDR, SWUR, LWDR, LWUR	Qflag	1.68	continuous/ 5 s / 5 s				Energy Balance 1 - Radiation - Kumasi	ncas-energy-balance-1_kumasi_YYYYMMDD_radiation_v1.2.nc
		Weather station	Davis Instruments	Vantage Pro 2 Wireless	T, RH, P, ws, wd, prec, RR, LWDR, UV-index	SWDR, Qflag	2	continuous/ 60 s / 60 s				Automatic weather station - Kumasi	ncas-aws-1_kumasi_YYYYMMDD_surface-met_v1.2.nc
		Sonic anemometer	Metek	uSonic-3	u, v, w, Tsonic		3.5	continuous/ 0.05 s / 60 s				Sonic Anemometer - Kumasi	ncas-sonic-1_kumasi_YYYYMMDD_mean-winds_v1.2.nc
Fast humidity probe	LI-COR	LI-7500	T, P, H ₂ O, CO ₂	sh, mr, sstf, sstP, sstH ₂ O, sstCO ₂ , sstson, sstson, Qflag(T, P, H ₂ O, CO ₂)	3.5	continuous/ 0.05 s / 60 s	Licor - Kumasi	ncas-licor-1_kumasi_YYYYMMDD_mean-co2-h2o_v2.nc					
Savé	KIT	Temperature / humidity sensor	Vaisala	HMP35A	T, RH		2	continuous/ 1 s / 600 s	10.6096/ DACCIWA-1690	KIT_MetData_Save	Save_KIT_EB10min_YYYYMMDD.nc		
		Pressure device	SETRA	Model 270	P		1.5						
		Sonic anemometer	Gill Instruments	Solent R1012	ws, wd		4					continuous/ 0.05 s / 600 s	
		Soil heat flux plates	Hukseflux	HFP01SC_05	shf		-0.05	continuous/ 1 s / 600 s					
		Rain gauge	Thies	HP	prec		1						
		Infrared thermometer	Heimann	KT15	Tsur		2						
		soil moisture /soil temperature probe	SMO, University of Karlsruhe	SISOMOP	SM, ST		-0.05, -0.1, -0.3, 0.5	continuous/ 600 s / 600 s					
		Net pyranometer	Kipp & Zonen	CG3	LWDR, LWUR		3	continuous/ 1 s / 600 s					
		Net pyrrometer	Kipp & Zonen	CM14	SWDR, SWUR		3						
		Temperature / humidity sensor	Vaisala	HMP35A	T, RH		2						
		Pressure device	SETRA	Model 270	P		1.5	continuous/ 1 s / 60 s					
		Sonic anemometer	Gill Instruments	Solent R1012	ws, wd		4					continuous/ 0.05 s / 60 s	
Soil heat flux plates	Hukseflux	HFP01SC_05	shf		-0.05								
Rain gauge	Thies	HP	prec		1	continuous/ 1 s / 60 s							
Infrared thermometer	Heimann	KT15	Tsur		2								
Net pyranometer	Kipp & Zonen	CG3	LWDR, LWUR	stdLWDR, stdLWUR	3								
Net pyrrometer	Kipp & Zonen	CM14	SWDR, SWUR	stdSWDR, stdSWUR	3	continuous/ 1 s / 60 s							
Net radiometer	Kipp & Zonen	DNr4	SWDR, SWUR, LWDR, LWUR		7.6								
Radiometer	Kipp & Zonen	PGS1	PAR		7.3								
Soil temperature probe	Campbell Scientific	T107	ST		Average between 0.05 and 0.155 m	continuous/ 0.1 s / 60 s							
Soil moisture probe	Campbell Scientific	CS616	SM		2 sensors - (a) on the mound, (b) in the furrow. Average between 0.01 and 0.31 m								
Soil heat flux plates	Hukseflux	HFP01	shf		-0.05								
Rain gauge	Environmental Measurement	ARG100	prec		1.3	continuous/ 60 s / 60 s							
Barometer	Druck	RPT410P	P		3.3								
Weather station	Vaisala	WXT520	T, RH, P		7.7		continuous/ 0.1 s / 60 s						
UPS	UPS		Thermo Fisher Scientific	48	CO ₂	Qflag(CO ₂)	8.1	continuous/ 10 s / 60 s	10.6096/ DACCIWA-1618	UPS_MetData-radiation-1min_Save	power1min_gobe_inrb_YYYYMMDD_000000_0a_v01_data.nc		
			ThermoEnvironment Instrument	4CCTL	NO	Qflag(NO)	8.1						
			ThermoEnvironment Instrument	4CCTL	NO ₂	Qflag(NO ₂)	8.1						
			ThermoEnvironment Instrument	4C	CO	Qflag(CO)	5						

Abbreviations	Long name
CO	Carbon monoxide concentration
CO ₂	Carbon dioxide concentration
D	Air density
H ₂ O	Water vapour concentration
LWDR	Long wave downwelling radiation
LWUR	Long wave upwelling radiation
mr	Mixing ratio
ND	Nitrogen dioxide concentration
NO ₂	Nitrogen dioxide concentration
O ₃	Ozone concentration
P	Air pressure
PAR	Photosynthetically active radiation
prec	Total amount of precipitation
Qflag	General quality flag
Qflag(XXX)	Quality flag of a specific parameter
Qnet	Net radiation
RH	Relative humidity
RR	Rain rate
sh	Specific humidity
shf	Soil heat flux
SM	Soil moisture humidity
ST	Soil temperature
std	Standard deviation of a specific parameter
SWDR	Short wave downwelling radiation
sstP	Soil water potential
SWUR	Short wave upwelling radiation
T	Air temperature
Tsonic	Sonic temperature
Tsur	Surface temperature
u	Eastward wind component
v	Northward wind component
w	Vertical wind speed
wd	Wind direction
wdir	Wind direction of gusts
ws	Wind speed
wsp	Wind speed of gusts

Table 4: Energy balance measurements

Site	Provider	Sensor annotation	Instrument provider/ manufacturer	Type	Measured parameter	Derived parameter	Derivation method	Measuring height in m AGL	Sampling rate temporal resolution	DOI	Data repository	Filename
Ie-Ite	OAU	Pressure sensor	Campbell Scientific	CSAT3		P		2.1	0.1 s/ 1800 s		OAU_EnergyBalance_Ite_Ite	Ite_Ite_OAU_EB30min_YYYYMMDD.nc
		Temperature/humidity probe	Campbell Scientific/ Vaisala	HMP60	T, RH	sh, D		2.1	10 s/ 1800 s			
		Soil heat flux plates	Hukseflux	HFP01	shf			-0.02, -0.05				
		Soil temperature probe	Campbell Scientific	T108	ST			-0.02, -0.05, -0.10, 0.30, -0.50				
		Net radiometer	Campbell Scientific/Hukseflux	NR01	SWDR, SWUR, LWDR, LWUR	Tsur, Onet		1.65				
		EC-System	Campbell Scientific LI-COR	CSAT3 LI-7500	Tsonic	ws, wd, H, E, u', TKE, RI, stdv, stds, sthw, stdTsonic, covw, covuw, covvTsonic, covw, covvTsonic, covwTsonic	EasyFlux DL v. 2.3	2.1				
Kumasi	NCAS	Sonic anemometer	Metek	uSonic-3	u, v, w, Tsonic	covwH2O, covwTsonic, H, E, MF_u, MF_v, Bo, BuF, Oflags	Aubinet et al. (2012) ¹⁸	3.5	0.05 s/ 1800 s	10.8036/ DACCWA.1663	Flux Estimates - Kumasi	ncas-flux-1_kumasi_YYYYMMDD_flux_estimates_v1.nc
		Fast humidity probe	LI-COR	LI-7500	T, P, CO ₂ , H ₂ O							
Save	KIT	Sonic anemometer	Gill Instruments	Solent R1012		Varu, Varv, Varw, VarH2o, VarTsonic, wd, ws, shf, Onet, H, E, u', D, ZL, Oflags(H, E, u')	Eddy-Covariance Software TK311 Mauder et al. (2013) ¹⁹	4	0.05 s/ 1800 s	10.8096/ DACCWA.1690	KIT_EnergyBalance_Save	KIT_EnergyBalance_SAVE_YYYYMMDD.nc
		Fast humidity probe	LI-COR	LI-7500								
	UPS	Sonic anemometer	Campbell Scientific	CSAT3	Tsonic	Varu, Varv, Varw, VarH2O, VarTsonic, VarCO2, ws, wd, H, E, F(CO2), u', D, TKE, MF, L, Oflags(H, E, CO2, H2O, MF), spikes(u, v, w, CO2, H2O)	EddyPro (LI-Cor) V6.20	7.77	0.1 s/ 1800 s	10.8096/ DACCWA.1618	UPS_EnergyFlux 30min_Save	lower10Hz_gobe_inrab_YYYYMMDD_0000_0_03_v01_daccwa.nc
		Soil Chemical fluxes	Thermo Fisher Scientific	171		F(NO), stdF(NO), F(NH ₃), stdF(NH ₃), Soil Type	Closed dynamic chamber technique	0.2	10 s/ daily		UPS_Biogenic Soil Fluxes_Save	UPS_BiogenicSoilFluxes_20180125.nc

Abbreviations	Long name
Bo	Bowen ratio
BuF	Buoyancy flux
CO ₂	Carbon dioxide concentration
covXX	Covariance of specific parameters
D	Air density
E	Latent heat flux
F(CO ₂)	Carbon dioxide flux
F(NH ₃)	Ammonia flux
F(NO)	Nitrogen oxide flux
H	Sensible heat flux
H ₂ O	Water vapour concentration
L	Obukhov length
LWDR	Long-wave downwelling radiation
LWUR	Long-wave upwelling radiation
MF	Momentum flux
MF_u	Momentum flux, eastward
MF_v	Momentum flux northward
P	Air pressure
Oflags	General quality flags
Oflags(XXX)	Quality flags of specific parameters
Onet	Net radiation
RI	Richardson flux number
RH	Relative humidity
sh	Specific humidity
shf	Soil heat flux
spikes(XXX)	Spikes of a specific parameter
ST	Soil temperature
stdX	Standard deviation of a specific parameter
SWDR	Short-wave downwelling radiation
SWUR	Short-wave upwelling radiation
T	Air temperature
TKE	Turbulent kinetic energy
Tsonic	Sonic temperature
Tsur	Surface temperature
u	Eastward wind component
u'	friction velocity
v	Northward wind component
VarXX	Variance of specific parameter
w	Vertical wind speed
wd	Wind direction
ws	Wind speed
ZL	Moran Obukhov stability parameter