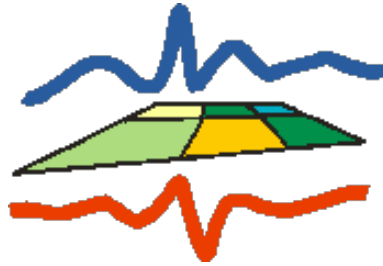


Transregio SFB 32
Subproject D2

Meteo Data from the 120m tower
at research center Jülich



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1 general description

Data stems from a 120m tower located in the NW side of the research center equipped with windspeed, temperature and humidity in 8 heights, wind direction in three heights, radiation in two heights and some more instruments. Geographical coordinates are: 6°24'34" east, 50°54'36" north, 91m asl. It is located in a forest with a tree height of 20m, i.e. below 20m you see effects of the forest micrometeorology above you see temperature-, humidity- and wind profiles following surface layer scaling laws (Monin Obukhov). Measuring heights are adapted to this situation: 2m is the classical WMO height, 10m is mid of the canopy, 20m top of canopy, 30m is 10m above canopy top (WMO height for wind), 50m is 30m above canopy or three times the last height, 80m is 60m above canopy or twice the height below, and 100m and 120m are one and two 20m steps higher. or details see the links 'Wetterstation' and 'Erlaeuterungen' and the current data page at fz-juelich.de (all of them in german).

Time is given as unix epoch (column 1) and textual date and time (columns 2 - 6). The first is given in UTC the latter is in central european time (CET) i.e. one hour ahead of UTC.

Humidity is measured with hair hygrometers (Version 800 L0-100, Lambrecht, Gttingen, Germany). The instrument at 120m reportet between July 21, 2011 and October 2 2012 only values around 100percent it has been replaced Oct, 2 2012 10UTC. The instrument at 100m gives too high values. In general the quality of the humidity data is not very high

Radiation is measured as total up- and down welling flux at 30m and 120m with two Pyrradiometers (type 8111) from Schenk GmbH, Austria. It has to be corrected for the longwave emission due to the temperature of the instrument ('Gehaeusetemperatur' (TTQQ(120m)) in columns 36 and 39):

$$R = R_{\text{raw}} + \sigma T^4 \quad (1)$$

where R_{raw} is one of the raw radiation values in column 34,35, 37 or 38, σ is the Stefan-Boltzman constant and T is the instrument temperature in Kelvin from columns 36 or 39. There was a slight difference between the two instruments at 30m and 120m due to an inaccurate calibration. The instrument @ 120m was exchanged on January 13. 2012 12CET, and calibration factors in the recording software were changed.

The outgoing radiation instrument at 120m (QQout(120m)) does not work since 28.05.13 10:00.

The sunshine duration instrument was defect between 22.7.2012 and 31.8.2012.

Pressure is station pressure, i.e. no reduction to sea level is performed. Currently (November 2012) occur occasionally fluctuations of 1hPa with a period of 1h (e.g. 15.11.2012). The source of this disturbance is not yet identified.

2 column assignment

Data here comes as monthly ascii files. Lignes beginnning with an '#' character are comments used for the header. Column assignment is given in every data file header in german. below is an english translation

column number	german	english	units
# Spalte 1:	epoch time (Sekunden seit 1.1.1970)	unix epoch (seconds since 1.1.1970 00:00)	UTC (!)
# Spalte 2:	Jahr	year	gregorian
# Spalte 3:	Monat	month	gregorian
# Spalte 4:	Tag	day	gregorian
# Spalte 5:	Stunde	hour	CET (!)
# Spalte 6:	Minute	minute	CET (!)
# Spalte 7:	Windgeschwindigkeit (FFss1(2m))	wind speed at 2m	m/s
# Spalte 8:	Windgeschwindigkeit (FFss1(10m))	wind speed at 10m	m/s
# Spalte 9:	Windgeschwindigkeit (FFss1(20m))	wind speed at 20m	m/s
# Spalte 10:	Windgeschwindigkeit (FFss1(30m))	wind speed at 30m	m/s
# Spalte 11:	Windgeschwindigkeit (FFss1(50m))	wind speed at 50m	m/s
# Spalte 12:	Windgeschwindigkeit (FFss1(80m))	wind speed at 80m	m/s
# Spalte 13:	Windgeschwindigkeit (FFss1(100m))	wind speed at 100m	m/s
# Spalte 14:	Windgeschwindigkeit (FFss1(120m))	wind speed at 120m	m/s
# Spalte 15:	Temperatur (PT100(2m))	temperature at 2m	°C
# Spalte 16:	Temperatur (PT100(10m))	temperature at 10m	°C
# Spalte 17:	Temperatur (PT100(20m))	temperature at 20m	°C
# Spalte 18:	Temperatur (PT100(30m))	temperature at 30m	°C
# Spalte 19:	Temperatur (PT100(50m))	temperature at 50m	°C
# Spalte 20:	Temperatur (PT100(80m))	temperature at 80m	°C
# Spalte 21:	Temperatur (PT100(100m))	temperature at 100m	°C
# Spalte 22:	Temperatur (PT100(120m))	temperature at 120m	°C
# Spalte 23:	rel.Feuchte(2m)	relative humidity at 2m	percent
# Spalte 24:	rel.Feuchte(10m)	relative humidity at 10m	percent
# Spalte 25:	rel.Feuchte(20m)	relative humidity at 20m	percent
# Spalte 26:	rel.Feuchte(30m)	relative humidity at 30m	percent
# Spalte 27:	rel.Feuchte(50m)	relative humidity at 50m	percent
# Spalte 28:	rel.Feuchte(80m)	relative humidity at 80m	percent
# Spalte 29:	rel.Feuchte(100m)	relative humidity at 100m	percent
# Spalte 30:	rel.Feuchte(120m)	relative humidity at 120m	percent
# Spalte 31:	Windrichtung (DDfs(30m))	wind direction at 30m	degree
# Spalte 32:	Windrichtung (DDfs(50m))	wind direction at 50m	degree
# Spalte 33:	Windrichtung (DDfs(120m))	wind direction at 120m	degree
# Spalte 34:	Einstrahlung (QQin(30m))	raw radiation (SW + LW) downwelling at 30m	W/m ²
# Spalte 35:	Ausstrahlung (QQout(30m))	raw radiation (SW + LW) upwelling at 30m	W/m ²
# Spalte 36:	Gehauesetemperatur (TTQQ(30m))	radiometer temperature at 30m	°C
# Spalte 37:	Einstrahlung (QQin(120m))	raw radiation (SW + LW) downwelling at 120m	W/m ²
# Spalte 38:	Ausstrahlung (QQout(120m))	raw radiation (SW + LW) downwelling at 120m	W/m ²
# Spalte 39:	Gehauesetemperatur (TTQQ(120m))	radiometer temperature at 120m	°C
# Spalte 40:	Sonnenscheindauer	sunshine duration	minutes
# Spalte 41:	Niederschlag	precipitation	mm/10minutes
# Spalte 42:	Luftdruck	pressure at 2m	hPa
# Spalte 43:	Windspitze	maximum wind speed in gusts at 30m	m/s