EUCLIPSE

Contact address:
Wilhelminalaan 10
3732 GK De Bilt
Postbus 201
3730 AE De Bilt
telefoon 030-220 69 11

Contactpersoon

Pier Siebesma
030-2206760
siebesma@knmi.nl

Date minutes
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Minutes secretary
Pier Siebesma

Attachement(s)

Subject

Minutes of meeting: Preperation for an observational dataset of European atmospheric profiling stations

Place and date of meeting

Paris, France, 2-3 December 2010

Participants:

P. Siebesma, H. Klein Baltink, F. Bosveld, M. Chiriaco, J-C. Dupont, E. O'Connor, M. Haeffelin, L. Klenov

December 2-3, 2010

Notes actions in bold/orange in the text below

INTRODUCTORY REMARKS:

GCMs : all models participating in CMIP-5; typical spatial resolution 100 km

Euclipse data is exclusively for evaluation of models, not for climate or trend studies. Hence the uncertainty requirement is not as stringent as those set by WMO/GRUAN (GCOS Reference Upper Air Network).

Period 2008-2010: all GCM are required to provide output at 1-hrly rate for this period and for all the variables listed in Euclipse.

Timeframe:

- GCM runs to be finished by January 2011
- Hard deadline have to be archived by May 2011
- Obs dataset should be provided by beginning of 2011, and certainly by May 2011

Frameworks:

- ARM CMBE
- ACTRIS – NA5
- GRUAN

Variables:

- Thermodynamic
- Heat flux
- Radiative fluxes
- Water variables

CF convention:

- Variable names: EUCLIPSE + ARM in 2 different attributes

AVERAGING PROCEDURE:

- Model output are snapshots on the hour
- **Averaging should be done as +/- 30 min around the hour, based on 1-min, or 10-min or 15-min data**
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UNCERTAINTIES: SEVERAL SOURCES

- **Measurement uncertainty:** provide this for each instrument and variable. Provide in the data file as an attribute to the variable, because it is a single value.
- **Temporal variability**: around the hourly mean is derived from the standard deviation from 1-min or 10-min data. If raw data are 15-min resolution, no temporal variability is computed. This is a separate variable in the file because it is time dependent.
- **Spatial representativity:** this is computed by using measurements from stations around the Observatories (e.g. Meteo-France stations around SIRTA). Take all available measurements in a 50-km radius area around the observatory (e.g. KNMI has 4 stations around Cabauw in a 50-km radius). Provide this as a separate variable in the file because it is time dependent. We only do this for State variables.

STATE VARIABLES:

Temperature:

At the observatory:

- Cabauw: 1-min resolution (or 10-min) - netcdf
- Chilbolton: 1-min resolution – netcdf
- IPSL computes hourly means and temporal variability for the 3 stations.
- Min and max are computed from 1-min data (on a new time axis)

Around the observatory

- KNMI provide hourly values of 4 stations around Cabauw and the weight of each station (IPSL computes spatial representativeness).

Pressure:

2-m air pressure AND sea-level pressure
- Each institute provides 1-min data
- also provide 1-hour values from sites around Cabauw (only valid for sea-level pressure)
- spatial variability for sea-level pressure

Wind:

- Issue: should we use cup (+/-0.7 m/s) or sonic anemometers? Cabauw provides cup anemometer data. Chilbolton provides sonic data. SIRTA provides both.
- Sonic: provide U + V at 1-min resolution
- Cup: F + D at 1-min resolution
- Each site provides F + D (hourly means) at sites around to compute spatial representativeness

RH:

- Uncertainty: 2% from 10 to 90%; 4% above and below
- All sites provide 1-min data for observatory and 1-hour data for sites around.

Specific humidity:

- **Ewan OC send the WMO formula(RH to SH) to JCD and to FB**

Precip:

- Hourly accumulation divided by 3600
- Provide 1-min data
- 1-hr accumulation for surrounding stations

FLUX VARIABLES:

Surface upward latent + sensible heat flux (evaporation and sublimation):

- Base this on sonic anemometers
- Choose lowest altitude at most open site (Zone 1, 10 meters). Check scatter plot at 1-hr resolution
- Provide lowest altitude flux for a defined surface (grass, or mixed)
- **FB provides a recipe to compute sensible and latent on 10-min base to correct for loss of low-frequency part. + random error.**
- Each observatory to provide latent and sensible heat flux on a 10-min resolution.
- Temporal variability: Six 10-min values → random error combined in squares
- Instrumental error: 5% for latent.

Options (slow track):

- Closure of energy budget: FB + JCD
- Gap filling techniques from FB

Surface radiation:

- Cabauw + Chilbolton provide 4 measured components at 1-min resolution.
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- **MH to ask Chuck Long to process Cabauw and Chilbolton data to get clear-sly SW and LW, and CF.**
- Compute albedo from SW down/up. Apply albedo to clear-sky SW to get SW up.
- Variability: std dev
- Get 1-min values from Chuck
- Clear-sky albedo: strong sza dependence
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Satellite TOA fluxes:

From Rob Roelling, SEVIRI-derived products:

- **Option 1:** Extractions of 15x15 (4x7 km) pixels around each site
- ~~Option 2: a larger area that extends over the 3 sites~~
- 10-min resolution products in NetCDF
- for SIRTA, Cabauw, and Chilbolton
- Climate SAF Products: **cloud fraction, LWP/IWP**, **phase, CTH, Cloud optical depth**, Re + Number (underlined = CMIP-5 variable)

GERB products:

- **KNMI will extract GERB data over all sites – all-sky TOA radiation: only variable included in the EUCLIPSE file.**
- **PS ask JPL if they are deriving clear-sky TOA.**
- **MH to ask CERES team for extraction of clear-sky TOA values above sites for 2008-2010.**

How to integrate this data: only TOA fluxes are included. Other parameters are in an appendix file for analysis purpose.

Water vapor path:

- 15-min GPS data
- Cabauw provide GPS IWV. 15-min resolution
- Chilbolton provide: Will try from GPS, otherwise MWR
- State the measurement uncertainty: Root mean square error: 1 mm
- Spatial uncertainty: undefined. Future work from multiple stations.

Integrated condensed water path:

- How to measure liquid water? MWR, except when it's raining (> 700g/m2).
- → Provide a MWR-only product: limited to LWP.
- → Ice water path: Reflectivity + temperature only (CloudNet processing)
- → Total water path
- **This is processed by U. Reading**

IWP and LWP provided by each partner on an hourly basis with variability. IPSL computes the TWP, and puts the 3 variables in the Euclipse file.

2-D CLOUD FRACTION:

NFOV derived from CloudNet profiles
WFOV: radiation-derived CF from Chuck Long.

3-D PROFILES:

- Cloud Fraction, LWC (mass fraction of liquid), IWC (mass fraction of liquid) from CloudNet processing
- Hourly average
- PS provides the vertical resolution. We provide a standard vertical grid +

DISTRIBUTION OF FILE:

ARM
COSMO consortium is pushing for BL dataset, by Frank Beyrich
Extension: combine ARM CMBE surface variables and CloudNet-derived profiles

→ Deadline for state variables for local site: January 15
→ Deadline for surrounding sites: February 15 (when will this data be available)
→ Deadline for radiation flux for local site: January 15
→ FB provides recipe heat fluxes by 15 January
→ Heat Flux variables: April
→ CloudNet processing by ?

Next technical meeting in April 2011
Next Euclipse in 6-10 June, in Exeter.