

## Minutes of the WG1 meeting in Rome (I), April 10&11 2002

Present: Ekaterina Batchvarova, Josef Brechler, Emilia Georgieva, Zbynek Janour, Ewa Krajny (new), Doug Middleton, Leszek Osrodka (new), Victor Prior, Mathias Rotach (chair), Cecilia Soriano

Guest: Daniel Martin (Meteo France)

Excuses: Ruwim Berkowicz

The most important points and discussions can be summarised as follows:

### ***New members:***

Again, two new members of WG could be welcomed. From Poland, that is to sign the COST 715 contract in the near future, *Ewa Kajny* and *Leszek Osrodka* have joined. [A note added in proof: Christian Sacré, representative of F in WG1, has informed me that he will no longer be able to attend the meetings (due to other COST commitments), but will be interested in receiving the respective information].

### ***'Urban Lidar Project'***

- ‡ Doug informed about a new project on the use of Lidar for the estimation of wind speed
- ‡ Goal: relate Lidar wind to surface observations from tower(s)
- contact: rob.young@quinetiq.com

### ***Report on activities and future work:***

#### *a) Determination of 'urban wind speed' from remote (e.g., airport) observations*

- Doug has started to analyse the data from Birmingham according to the procedure outlined on the homepage.
- ‡ There seems to be little variation of  $u^*$  with height [note by Mathias: this doesn't come as a surprise, since in this data set all the observations were done well above the average building height!].
- ‡ Data set includes:  $u^*$ (urban) vs.  $u^*$ (rural). An important quantity to look at!
- ‡ Doug will proceed in the analysis of the data
- ‡ Mathias will have to define specific 'tasks' for students, i.e. parts out of the proposed procedure that can be looked at in some thesis work

#### *b) Near surface wind: urban vs. rural:*

- ‡ Cecilia proposed a 'unification' of the data sets (of the 'Zurich paper') in order to make them more comparable. This includes: averaging time, possibly: selection according to urban (rural) wind directions
- ‡ Also, for each of the data sets information about the instruments (starting speed, overspeeding etc.) and the sites (possible characteristic sectors) are required.

- ‡ Emilia suggested to discriminating among 'classes' of wind speed/direction. She will provide information on the 'WMO classification'.
- ‡ Cecilia will approach the data providers to yield the information. Also, a common format of the plots (x: rural, y: urban) should be reached.
- ‡ Next step: detailed analysis of *comparable data sets* → conclusions → publication.

c) UBL wind profile

- ‡ The Rossby number similarity approach was briefly reiterated by Zbinek. For  $z > z_r$ : *similar* profiles. Estimate:  $z_r = 10 * z_o$ . **However**: for a rough surface  $10 * z_o$  corresponds roughly to the average building height (h).  $Z_r$  should be considerably larger than h!
- ‡ Comparison with data (only neutral case): inconclusive, i.e., or one data set (Ranco) quite fortunate while another dataset (Prague) leads to large departures.
- ‡ Next steps: better evaluation of *surface parameters* using the LUMPS parameterisation (which is an extension for urban surfaces of Hanna & Chang [1993]) by Grimmond and Oke (subm). Mathias will send information to Zbinek. Information on mean building heights from data providers required.
- ‡ Also: more data sets are needed!

d) Urban networks

Victor informed on the state of the network on urban stations in Portugal. Detailed information can be obtained from [www.meteo.pt/RUEMA/inicial.htm](http://www.meteo.pt/RUEMA/inicial.htm).

- *Horizontal variability within a city* can be investigated from 3 sites in Lisbon
- caveat: all observations at 6m above ground *or* above roof.

### Homepage

Leftover from last meeting! Will have to be updated! Especially: contact information. Mathias will have to do this.....

### Final report

Strategy (from Toulouse meeting): publish available WG1 results in the open literature. Keep the actual report as short as possible and add the publications as appendices. The appendix contains the outline of the final report including prospective authors (or existing texts).

### Related events

- EGS 02: Session on *urban meteorology and urban air pollution*. Also *Basic turbulence studies* with an emphasis on [...] (iv) 'The roughness sublayer of the turbulent boundary layer especially over urban areas'.
- Fourth AMS Symposium on the Urban Environment, 20-24 May 2002, Norfolk, VA,
- Harmonisation conference, Sofia, 14 -17 October 2002
- 46th Oholo Conference on Flow and Diffusion in the Urban Environment, October 2002, Eilat, Israel. Information: <http://www.iibr.gov.il/oholo>
- 5<sup>th</sup> Int. Conference on the Urban Climate (ICUC): September 1-5, 2003 Lodz Poland. Information (<http://www.geography.ohio-state.edu/UrbanClimate/>).

- 4<sup>th</sup> Urban air quality conference: March 2003

***Next meeting:***

In connection with the next MC meeting:

Aside the Harmonisation conference, Sofia, 14 -17 October 2002

**Varia:**

As a **vice chairperson** for WG1 Cecilia was elected with acclamation. Mathias announced that he would be spend a year in the USA, more precisely at the NCAR in Boulder CO. He will keep his responsibilities as a chairperson of WG1 – but may not be able to attend one or the other of the future meetings.

**Appendices (next pages):**

- Outline final report
- Address list of WG1

# Outline Final report (revised)

[in red: person dedicated or reference to existing text]

## 1 Introduction [Rotach]

- 'Wind' = mean wind and turbulence (higher moments)
- what 'wind information' is required for 'urban air pollution'?
- overview

## 2 The Structure of the urban BL [Rotach et al. → summary Zurich workshop]

2.1 Vertical

2.2. Horizontal (spatial?)

2.3 Time evolution

## 3 Theories & Methods

3.1 Wind speed close to the surface

3.1.1 'rural-urban' intercomparison [Soriano et al. – Zurich and future paper]

3.1.2 Suggested procedure to estimate 'urban' wind speed from rural reference [Middleton and Rotach – 'procedure' updated and comparison to obs. (future paper)]

3.2 Wind speed in the UBL

3.1.1 Rossby number approach [Janour et al. – Zurich workshop and future paper]

3.3 Turbulence

3.2.1 Roughness sublayer incl. Canopy [Kastner-Klein – Zurich workshop]

3.2.2 Urban boundary layer [nothing exists yet!]

## 6 Implications for dispersion modelling [Rotach]

→ importance of taking into account 'the above'

6.1 Lagrangian particle models

6.2 Eulerian prognostic models

6.3 Simple Gaussian plume models

## 7 Summary and recommendations (Rotach)

Appendix: Data sets (→ CD) (Batchvarova – permissions)

## Members List

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