

Minutes of the Eleventh COST 715 Meeting of Working Group 2

Vienna, Austria, 18 and 19 March 2004

Participants:

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1. The agenda was adopted slightly revised and is given in Annex 1. Addresses of WG 2 members are given in Annex 2.
2. The minutes of the Lannemezan meeting have been adopted without change. MP checked which parts of the work plan agreed upon in Lannemezan (Annex 5 of the Lannemezan minutes) had been done.
3. MP briefly reported on the Berlin COST 715 Expert meeting 12/13 February 2004. A new draft outline of the common COST 715 report has been drafted (Annex 3). WG 2 will contribute to sections 4 and 5 and also to sections 14 and 15. These contributions have to be done as soon as possible; MP will make drafts of sections 4 and 5 to be revised by WG 2 members.
In order to have also the extended WG 2 report reviewed by Sven-Erik Gryning (which he agreed to do) at the next Harmo9 conference, it is necessary to submit a final version approx. at the end of April 2004.
- 4.

4.1 Status of draft final report at the meeting:

MP briefly reported on recent contributions to the draft final report (DFR; structure see Annex 4) by A. Christen (AC) and K. De Ridder (KR). AC sent texts on the urban surface (section 2 of DFR) and Basel heat flux and MH results (current sections 5.2.4, 5.3.3). Additional results on Basel MH are to be expected. KR sent contributions to sections 3.1.6 (ARPS model modifications), 5.2.2 (heat flux results for Paris) and 6 (Satellite remote sensing). Support for finalising section 6 will come from PM.

PM submitted extended texts on sections 3.1.5 (SM2-U – model) and 5.1.2 (description of UBL/Escompte), heat flux results (section 5.2.5). Urban SEB theory is in preparation (section 2). Delivery of UBL/Escompte MH results is under discussion.

AB delivered texts for sections 3.2 (heterogeneity) and 3.3 (temperature roughness). 3.1.7 (urbanisation of NWP models) will follow. Amendments to sections 4 and 5 will be done when available from a new draft of the MH paper (MH calculations by MT, MD and JB as well as AB are under way).

AK contributed to 4.2.2 (ceilometer, wind profiler), 5.1.6 (Helsinki experiment, first draft) and 5.3.6 (MH results Helsinki). JB added to section 4.2.2 (sodar) and 4.2.4 (tracer data, together with MD), drafted 5.1.5 (Cracow exp.) and sections 5.2.3 (heat flux results) and 5.3.5 (MH results). MT:

Description of Athens exp in 5.1 and MH results in 5.3 is in preparation.

MD: Description of Bologna exp. (5.1.4) and results in 5.2 and 5.3 are in preparation. DM provided text for 4.2.2 (lidar) and 4.2.3 (AMDAR data) as well as 5.1.3 (Birmingham exp.) and 5.2.6 and 5.3.7 (Birmingham heat flux and MH results).

4.2. Planned and expected contributions received when writing these minutes mid-April 2004: see Annex 4 for the current list of contents of the draft final report (DFR).

Main new results received are from Bologna, Athens, Cracow/Katowice, UBL/Escompte; a lot of MH comparisons are now available and included in the DFR. SJ carefully edited the draft and re-structured the MH results section.

4.3: see item 3 of these minutes for the timetable. Careful harmonising and editing of the DFR is still necessary.

5. When writing these minutes, WG 2 has almost finalised chapters 4 and 5 of the final report of the action.
6. The WG 2 overview contribution for the Harmonisation Conference in Garmisch in June 2004 was drafted by MP, revised mainly by SJ and submitted on April 1, 2004.
7. SJ reports on COST-715 follow-up Actions. COST-728 on “Enhancing meso-scale met. modeling capabilities for air pollution and dispersion calculations” will hopefully be accepted in spring 2004. Schatzmanns proposal “Quality assurance and improvement of micro-scale met. models” is under discussion in the TC. SJ also presented “Urban science forward look”: new partnership between COST and ESF. The TC will also promote the organisation of seminars for “urban” and “marine” science.

Annex 1: Agenda

1. Welcome and adoption of agenda
2. Adoption of Lannemezan minutes
3. Short report from Berlin and timetable (MP)
4. Final report of WG 2
- 4.1 Presentation and discussion of contributions
 - Contributions by AC/RV and KR (presented by MP)
 - Contribution by PM
 - Contribution by AB (MH paper)

Contribution by AK
Contribution by JB
Contribution by MT
Contribution by MD
Contribution by DM

4.2 Discussion of draft final report

4.3 Work plan for finalisation

5. Final report of the action (MP)

6. Garmisch overview paper (MP)

7. AOB

Annex 2: List and addresses of WG 2 members

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Annex 3: Outline Structure of COST 715 Final Report

Meteorology applied to Urban Air Pollution Problems

Contents List

1. Introduction	BF
2. Structure of the urban boundary layer	MR
3. Modification of flow and turbulence structure over urban areas	MR
4. The surface energy balance in urban areas	MP
5. The mixing height and inversions in urban areas	MP/JK
6. Evaluation and analysis of European peak pollution episodes	JK
7. Meteorological aspects of air pollution episodes in southern European cities	NM
8. Preparation of meteorological input data for urban air pollution models	MS
9. Testing meteorological pre-processors: the MESOCOM experiment	NM
10. Basel UrBan Boundary Layer Experiment (BUBBLE)	MR
11. Forecasting Urban Meteorology, Air Pollution and Population EXposure (FUMAPEX) AB	
12. Bilateral cooperation on urban boundary layer studies	EB
13. Summary of achievements	BF
14. Gaps in knowledge	All
15. Conclusions and recommendations	All
16. References	
17. Appendices	
A. Definitions	
B. Published work related to COST 715	
C. List of COST 715 workshop reports	
D. List of participants	
E. Acknowledgements	

Annex 4: Current list of contents of draft final report of WG 2

1. INTRODUCTION

2. THE STRUCTURE OF THE URBAN BOUNDARY LAYER

3. PRE-PROCESSORS, SCHEMES AND MODELS FOR THE SURFACE ENERGY BUDGET

3.1 THE URBAN SURFACE ENERGY BUDGET

3.2 PREPROCESSORS AND MODELS

3.2.1 Introduction

3.2.2 Local-scale Urban Meteorological Pre-processing Scheme (LUMPS)

3.2.3 The Town Energy Balance (TEB) scheme

3.2.4 The Finite Volume Model (FVM)

3.2.5 The SM2-U soil model

3.2.6 Urban parameterisations in ARPS

3.2.7 Urbanisation of NWP models for urban air pollution forecasting

3.3 EFFECT OF STRONG HETEROGENEITY ON SURFACE PROPERTIES AND FLUXES

3.4 TEMPERATURE ROUGHNESS

3.5 SYNTHESIS AND OUTLOOK

4. PRE-PROCESSORS, SCHEMES AND MODELS FOR DETERMINING THE MIXING HEIGHT

4.1 INTRODUCTION

4.2 EXPERIMENTAL METHODS FOR ESTIMATING THE URBAN MH

4.2.1 Diagnosing MH from radiosonde data

4.2.2. MH interpreted from sodar/lidar/radar/ceilometer

4.2.3. Commercial aircraft measurements / AMDAR Data Processing

4.2.4 Mixing heights deduced from tracer data

4.3. STANDARD MH PARAMETERISATIONS AND PRE-PROCESSORS USED FOR URBAN CONDITIONS

4.3.1 Classical ABL formulae

4.3.2 Approaches using free flow stability

4.4 EFFECT OF INTERNAL BOUNDARY LAYER DEVELOPMENT ON THE MIXING HEIGHT

4.5 METHODS BASED ON NWP OUTPUTS

4.6 EFFECT OF COMPLEX TERRAIN FEATURES

5. EXPERIMENTAL DATA SETS AND MODEL VALIDATIONS

5.1 RECENT EXPERIMENTAL CAMPAIGNS

5.1.1 Basel, Switzerland

5.1.2 Greater Marseilles area, France (UBL-Escompte)

5.1.3 Birmingham, UK

5.1.4 Bologna, Italy

5.1.5 Cracow, Katowice, Poland

5.1.6 Helsinki, Finland

5.1.7 CALRAS data set

5.1.8 ATHIBLEX/MEDCAPHOT experiments in Athens

5.1.9 Copenhagen, Denmark

5.2 DATA VALIDATION OF SURFACE ENERGY BUDGET SCHEMES AND MODELS

5.2.1 North America

5.2.2 Basel

5.2.3 Marseille (UBL-Escompte)

5.2.4 Birmingham, UK

5.2.5 Cracow

5.2.6 Bologna

5.3 DATA VALIDATION OF MIXING HEIGHT SCHEMES AND MODELS

5.3.1 Data, challenges and limitations

5.3.2 Comparison of data vs. numerical pre-processors and NWP models

5.3.2.1 Comparison with pre-processors

5.3.2.2 MH estimates from NWP/meteorological models

5.3.3 Comparison of MH-schemes with radiosonde profiles

5.3.4 Data vs. SBL diagnostic formulations

5.3.5 Data vs. CBL prognostic and diagnostic formulations

5.3.6 Data vs. NBL diagnostic formulations

5.3.7 Comparison between UHF profiler and RASS data

5.3.8 Comparison between sodar and tethered sonde data

5.3.9 MH deduced from tracer gas concentrations

5.3.10 Lisbon

6. REMOTE SENSING TOOLS TO ESTIMATE SURFACE FLUXES AND CANOPY CHARACTERISTICS

6.1 INTRODUCTION

6.2 SATELLITE REMOTE SENSING PLATFORMS AND INSTRUMENTS

6.3 REMOTE SENSING OF THE SURFACE SENSIBLE HEAT FLUX

6.4 REMOTE SENSING OF SURFACE PARAMETERS

6.5 CONCLUSIONS

7. RECOMMENDATIONS AND NEEDS

7.1 IMPROVEMENT OF EXISTING PRE-PROCESSORS, SCHEMES AND MODELS FOR THE SURFACE ENERGY BUDGET

7.1.1 Processes

7.1.2 Regulatory models

7.1.3 Numerical 3D models

7.2 IMPROVEMENT OF EXISTING PRE-PROCESSORS, SCHEMES AND MODELS FOR THE MIXING HEIGHT

7.3 OUTLOOK FOR DEVELOPMENT OF NEW SCHEMES

7.4 IMPROVEMENT OF INPUT DATA AVAILABILITY AND QUALITY FOR RESEARCH AND MODEL VALIDATION

7.5 MONITORING STRATEGY FOR REQUIRED PARAMETERS

7.6 NEED AND PLANNING OF FUTURE FIELD CAMPAIGNS

LIST OF REFERENCES

REFERENCE (ADDITIONAL FROM AC)

REFERENCE (ADDITIONAL FROM PM)

REFERENCE (ADDITIONAL FROM KR)

REFERENCE (ADDITIONAL FROM AB)

FUMAPEX REFERENCES

REFERENCES (ADDITIONAL FROM MT)

REFERENCES (ADDITIONAL FROM AB, SECTION 5.1.9)

REFERENCES (ADDITIONAL BY MD):