

6th SATURN Workshop

Garmisch-Partenkirchen, 13 March 2002

Attendees

<i>A/A</i>	<i>Name</i>	<i>A/A</i>	<i>Name</i>
1	R. Almbauer	21	K. Karatzas
2	J. Baldasano	22	A. Karppinen
3	T. Bentham	23	J. Katolicky
4	E. Bolzacchini	24	J. Kukkonen
5	C. Borrego	25	S. Larssen
6	L. Bozó	26	P. Louka
7	J. Brechler	27	P. Mestayer
8	C. Carnevale	28	N. Moussiopoulos
9	E. Decanini	29	D. Öttl
10	S. Despiau	30	F. Palmgren
11	G. Finzi	31	F. Pascheke
12	V. Gabusi	32	C. Pertot
13	S. Galmarini	33	M. Pohjola
14	E. Genikhovich	34	L. Pozzoli
15	D. Grawe	35	M. Schatzmann
16	M. Graziaperrone	36	H. Schlünzen
17	T. Halenka	37	A. Shavrina
18	O. Hertel	38	R. Sokhi
19	D. van den Hout	39	M. Sosonkin
20	S. José	40	A. Trukenmüller

Draft Minutes

Opening

The meeting started with a welcome by the subproject co-ordinator Dr. Moussiopoulos and the presentation of the agenda of the workshop.

N. Moussiopoulos: SATURN, the state-of-play

Dr. Moussiopoulos presented the latest progress in SATURN. The state of the PIs was first mentioned. Dr. Levitin is a new PI from the Israel Meteorological Service; Dr. Louka has replaced Dr. Sahn for LHTEE, while Dr. Robins will replace Dr. Savory for the University of Surrey. Drs. Andersson-Skoeld and Pakkanen have completed their work within SATURN, while Drs. Carruthers and Coppalle have not contributed to the Annual Report 2001.

The executive group is composed by Drs Borrego and Graziani responsible for the urban cluster, Palmgren and Schatzmann responsible for the local cluster, van den Hout and Larsen responsible for integration and Moussiopoulos as the subproject co-ordinator.

The co-ordination activities in the last year were mentioned, namely, the printing-out of the Annual Report 2000, the preparation of the Annual Report 2001 (draft version), the progress in all three clusters, the launching of ESCOMPTE_INT, and the agreement on the contents of the Final Report.

The challenges to follow were presented, namely, the finalisation of the Annual Report 2001, the contribution to the EUROTRAC-2 Synthesis and Integration, the steps towards the SATURN termination (Cluster status, FOSEC, ESCOMPTE_INT, Final Report), and the future after SATURN.

The good progress of the Annual Report 2001 was stressed. 32 individual contributions were received. The balance among the clusters was good, the scientific level adequate and the timing excellent.

Dr. Moussiopoulos presented the operational plan of SATURN. Currently in Phase C, the actions that need to be concluded are: (a) process description by the aid of models; (b) conclusive validation of model systems; (c) compilation of complete validation datasets; and (d) conclusion of integrated air quality management systems. Within this phase, the FOSEC activity has been launched, special emphasis on urban aerosols has been undertaken and the AFO/VALIUM project commenced.

The schematic representation of EUROTRAC-2 Synthesis & Integration followed. The themes are: (1) Fluxes of air pollutants to and from the surface in Europe; (2) Air quality in cities: Local and urban issues; (3) Photochemical ozone and its control; (4) Global and regional ozone budget; and (5) Tropospheric aerosols and clouds.

The co-ordinator reminded the participants on the scientific aims of SATURN, i.e. model development, model evaluation, experiments, and integration. The objective and aims of FOSEC were also repeated. The FOSEC co-ordination team is comprised of Drs. Borrego, Graziani, Moussiopoulos and Peuch.

The annotated table of contents of the Final Report of the sub-project was presented. The chapters that will be included are: (1) Introduction; (2) Air pollutant emissions in cities; (3) Urban air pollution phenomenology; (4) Urban field campaigns; (5) Particulate matter in urban air; (6) Modelling urban air pollution; (7) Quality Assurance of urban air pollution modelling; (8) Photochemical smog in South European cities; (9) Integrated urban air quality assessment; and (10) Conclusions. For the optimum organisation of the Final Report a matrix will be completed to account for the work of each PI in each chapter.

The co-ordinator presented an EC project template to be filled in by the PIs that may be used as a starting point towards forming networks, the idea being to define networks to constitute EUREKA projects and parts of a new research program for the future.

Finally, three conferences were announced in 2002, namely, (a) EURO-SUSTAIN in Rhodes, 2-5 April 2002; (b) Symposium "Transport and Air Pollution" in Graz, 19-21 June 2002; (c) 8th Model Harmonisation Conference in Sofia, 14-17 October 2002. In addition, it was confirmed that the next Urban Air Quality conference will take place in Prague in March 2003.

Local cluster

F. Palmgren: Particulate Matter in urban areas

Dr. Palmgren summarised the achievements and gaps regarding PM in the local scale. Several experiments were performed and high-quality data sets were made available regarding gaseous pollutants (e.g. dispersion and fast chemical processes, new techniques, exposure). Experiments on particles were also performed, although the particle emission factors need more attention. Health effects of particles were investigated, namely epidemiological effects of PM₁₀ were explored and pronounced relationship to PM_{2.5} was observed. In addition, PM₁ and smaller have a pronounced effect on human health. Particle size distribution and origin were investigated, while the importance of particle parameters, i.e. physical and chemical measures (e.g. total mass concentration, number, polycyclic aromatics, etc.) was stressed.

M. Schatzmann: Model validation at the local scale

Dr. Schatzmann focused on the systematic differences between data and model results, the "smart" validation strategies, some examples from real cases, and actions remaining to be completed.

The importance of the quality of the measurements and the selection of the data used for model validation was stressed. It has been shown (e.g. TRAPOS network) that there can be large differences among model results using the same turbulence model, between model and wind-tunnel results, and between wind-tunnel and field experimental results. There is also a large scatter in the measured field data if single half-hour average values will be used instead of averaging over all data points. The new experimental techniques aim at providing with high-quality data sets for model validation. However, care should be always taken on the selection of the data sets (e.g. avoiding comparisons of model and experimental results at locations of large airflow irregularities).

Urban cluster

C. Borrego: Urban cluster; Status and gaps

Dr. Borrego presented the status and gaps within the urban cluster. Regarding model development, a large number of models were validated and improved. The M-SYS modelling system was introduced. The MESOCOM model intercomparison activity treated an ideal well-defined case aiming at reducing the model differences. The results showed large differences on spatial distribution, time of arrival and intensity of sea breeze front and slope winds. The main reasons identified to cause the model differences were the surface layer parameterisation of sensible heat fluxes, the horizontal diffusion and the boundary conditions applied. New model intercomparison activity ESCOMPTE_INT was launched in the frame of SATURN.

Intensive urban scale campaigns were performed during the last months. Dr. Borrego mentioned the findings of the ESCOMPTE campaign that took place in Marseille during the

high pollution event of 20-26 June 2001 as well as the associated project UBL/CLU performed in Marseille between 5 June and 15 July 2001. Other campaigns referred were those of aerosol concentration measurements in Finokalia (Greece) and aboard the “Aigaion”; particulate matter analysis in Milan; air pollution in St. Petersburg area; human exposure studies and measurements of fine and ultrafine particles in Denmark; and pollutants and particles in the UK.

The modelling quality objectives established by European Directives for different pollutants (SO₂, NO₂, NO_x, PM, Pb, CO, benzene) and quality indicators were discussed.

The questions that Dr. Borrego believes are necessary to answer are: Are the data/models available?; Is the quality of the data/models known and reported?; Who is the end-user of the collected data/models?; Is there a harmonised approach for the model evaluation within SATURN? How can we guarantee and prove that SATURN models are adequate and useful tools to support new AQ Directives?

In the following discussion Dr. van den Hout noted that the quality objectives set by the European Directives are not applied to prognostic modelling and are not recommended for compliance checking. Dr. Larssen agreed and mentioned that the numbers given should be relaxed, while Drs. Borrego and Palmgren suggested that these numbers are only indicative. Dr. Kukkonen added that apart from the maximum and average values more statistics should be taken into account.

S. Galmarini: The ESCOMPTE INT activity

Dr. Galmarini summarised the latest news on this activity. Its aim is to assess the modelling capacity to reproduce the circulation at the mesoscale and the dispersion of a passive tracer based on the ESCOMPTE pre-campaign data.

Comparison of modelling results includes wind and temperature field at surface, surface heat flux, vertical structure, tracer dispersion. Only a few groups have sent model results so far.

P. Louka: The FOSEC (Formation of Ozone in South European Cities) activity

Dr. Louka summarised the status of FOSEC. Progress has been achieved regarding collection of related studies. However, despite the progress there is still poor collaboration among the groups for gathering the FOSEC related results. Large gaps remain, especially for the association of aerosols and photochemical pollution in South Europe.

Discussion on both the local and urban clusters followed focussing on the achievements and the remaining gaps. In particular, it was noted that the experiments performed gave a good insight on the physical and chemical mechanisms occurring within the urban environment. In addition, definition and development of a proper methodological approach for emissions has been achieved. Concerning the urban modelling part, there has been considerable development of a generally accepted evaluation concept of urban pollution models, although such development was less than expected mainly for the urban cluster. Due to the limited interaction with CMD sub-project no aerosol chemical transformation module was developed. Regarding the development of a basis for exposure estimates, there has been some progress mainly through GLOREAM sub-project. There has been better understanding on the specification of data involved for model validation. ESCOMPTE_INT activity will help towards the validation of urban-scale models and results are expected to be presented on the web by the summer. A meeting for discussion of the results is expected to take place in the late summer, while a report will be compiled by the end of the year. The participants agreed that the focus of the ending phase of SATURN should be the development of data sets for model evaluation.

Integration cluster

D. van den Hout: SATURN Integration

Dr. van den Hout summarised the PIs contributions for the integration cluster in 2001 and recapitulated the achievements and gaps. The work on AQMSs was continued and there has been interaction with users. In particular, new data and models, uncertainty analysis and technical improvements were achieved; the concepts and purposes of AQMSs were rethought; convergence of the approaches and techniques due to stronger European component (SATURN; EU legislation) was achieved, while there was divergence of the approaches and techniques due to new ITC techniques; AQMSs gradually connect to fields adjacent to the core air quality field: exposure, related environmental fields; there was hardly progress in costs assessments; mesoscale models have been successfully tested in Southern Europe and combined with hotspot models, while prognostic modelling also progressed.

Regarding the SATURN's framework project two reports have been completed: "The assessment of urban air quality" report; and report for municipal air quality specialists: "SATURN's Synthesis Report". The AQM website <http://www.euocities.org/aqm/> is now available, while the INTEGAIRE network 2002-2004 was launched.

The main gaps are related with the integration with adjacent scales, i.e. larger scales (still work should be done), exposure and risks (although there has been considerable progress gaps remain), and costs (hardly taken into account). Other aspects that are needed for decision making should be enhanced (e.g. noise from traffic). Regarding support to air quality managers, i.e. to the end-users needs, recommendations have been given but concrete solutions are still not available.

In the following discussion, it was stressed that despite the presence of gaps there has been considerable progress regarding the integrated knowledge and tools that were set initially as scientific aims of SATURN (Framework project), while specific deliverables have been met. Dr. Larssen underlined the difficulty of merging all delivering tasks. He noted that it should be up to the AQMS developers to take into account the separate achievements. The integration of all achievements to AQMS should be the topic of SATURN's follow-up. The participants agreed that the integration of the achievements in AQMS is certainly time-consuming. Dr. Karatzas further noted that contemporary legislation has posed more demands since the definition of AQMS by SATURN and these are the needs that the new projects should be aiming to cover.

New projects - Discussion

The final part of the workshop concentrated on possible future projects under FP6. Dr. Sokhi stressed the necessity of stating expression of interest for an Integrated Project (IP) or Network of Excellence (NoE) soon. Dr. Schlünzen proposed that since the evaluation activities (e.g. MESOCOM, ESCOMPTE_INT) are important they may be part of "new SATURN" as groups of projects/activities. Drs. Moussiopoulos and Kukkonen added that such activities may be part of COST. Dr. van den Hout noted that the "new SATURN" should be in accordance with the topic requirements of FP6. On the same basis Drs. Schatzmann and Sokhi stressed that the future action should include topics such as global change and ecosystems, sustainable transport and effects on health. Drs. Moussiopoulos and Larssen proposed the development of an "umbrella" of networks as the "new SATURN", a suggestion that the attendees agreed with.