

OA13/HS2 Precipitation Measurements, Modelling and Forecasting

02 Stochastic Modelling of Rainfall in Space and Time

Rainfall has been a focus topic of scientific meetings for many years, due to the role it plays in modelling the hydrologic cycle. The two-days session devoted to stochastic modelling of rainfall in space and time was co-sponsored by the American Geophysical Union Precipitation Committee, and directly followed a related session on rainfall estimation and forecasting by radar and satellite. As a consequence a large number of contributions was received, covering most of the topics that were included in the session programme. The final programme in Grenoble was thus organized in five oral and one poster sub-session for a total number of contributions of about 50.

The first group of paper was concerned with the coupling of deterministic and stochastic approaches to rainfall modelling, a topic currently attracting more and more research with some promising results. Specifically the contributions focused either on the physically based modelling of rainfall fields incorporating some random components, or on downscaling of large scale models by stochastic methods coupled with weather type classification.

A second group of contributions dealt mainly with analysis and forecasting of rainfall using a wide range of methods, both conventional and not. Concerning these contributions, a major comment should be spent on the trend that forecasting procedures show in making use of additional (mainly atmospheric) variables other than rainfall to identify models for prediction purposes.

Scaling and fractal analysis of rainfall in space and time was the topic of the third session. From the detection of scaling properties in the natural processes to the formulation of predictive models, looking at rainfall under this view seems to provide a very promising approach to precipitation modelling. Although specific predictive models were presented, it should be also remarked that in most of the cases further research is still needed to come up with operational scaling-based models, which can be suitable in practical hydrology.

Traditional stochastic modelling of rainfall fields and temporal rainfall was covered by the contributions of the two remaining sub-sessions. Both the number and the level of presentations showed that this research argument still involves many research efforts. This especially time for space time stochastic modelling and for stochastically based real-time prediction techniques, which the lack of suitable alternative methodologies make still appealing. In this view also results denoted that stochastic prediction of rainfall fields still holds as the most suitable tool for operational hydrology.

Finally, a comment must be made concerning the poster session. It was expected to count about one third of total presentation, homogeneously extracted from the five sub-sessions. We must, unfortunately, report more than 45 % missing papers; a totally unexpected result.

P. Burlando, D. Koutsoyiannis

OA14/HS8 Atmospheric and Hydrological Processes and Models at the Soil-Vegetation-Atmosphere Interface: Results from Recent International Experiments

01 Hydrology, Soil and Vegetation

The sub-session described the results of a number of sub-surface and surface process and modelling studies carried out within the context of international experiments, such as HAPEX-Sahel and EFEDA2, and designed ultimately to improve parameterisation at the GCM scale. Both field and modelling studies were well represented. Papers and posters covered the entire range of processes from groundwater recharge to rainfall distribution; new techniques to measure soil moisture content and infiltration rates were also described. A common theme running through many of the contributions was the problem of spatial variability at all scales, whether it be rainfall, evaporation or infiltration, and the difficulty of providing regional values at the scale of the GCM. The particular importance of variability of sub-surface processes and the need to tackle these problems more intensively than has been the case in earlier international experiments was stressed in the keynote address.

J. Bromley

03 Remote Sensing

In the Remote Sensing sub-session there were 10 oral and 5 poster presentations. The oral presentations reported mainly the results of 2 international field experiments which provided intensive ground validation of a range of remotely sensed measurements. H.J. Bolle presented an overview of EFEDA which was based in Central Spain in 1991 and Y.H. Herr described HAPEX-Sahel which was based in Niger in 1992. The papers which were presented addressed the problems of upscaling from detailed point measurements made at or near the earth's surface to spatially extensive aircraft and satellite measurements. The conclusions were that most of the physical corrections which must be applied to allow for such things as atmospheric effects or sensor spectral, angular and temporal mismatches are now quite well understood, but there is still a lack of knowledge about the behaviour and interaction of differing vegetated surfaces. Detailed ground-based observations of heat and moisture fluxes are required over a range of vegetation types and mixtures before scaling up to synoptic remote sensing measurements is fully viable.

K. Blyth

OA16 Source, Transport and Deposition of Mineral Dust-Radiation

During this wide and productive session, the main aspects of the mineral dust cycle have been covered by fifteen communications, most of them reporting the work performed by french teams in the framework of the CNRS program "Erosion Eolienne en Régions arides et Semi-Arides". Several talks dealt with the origins of the dust transported over oceanic regions or trapped in sediments: various powerful techniques were used such as satellite survey, geochemical and isotopic tracers, 3-D air mass trajectories. Based on eight years of IR Meteosat data, a climatology of source regions of dust over the Sahara and