International Conference on Alpine Meteorology and MAP Meeting 19–23 May 2003, Brig, Switzerland

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We are delighted to present the third and final part of the Special Issue Series devoted to the ICAM/MAP Meeting 2003, where MAP stands for the Mesoscale Alpine Programme. The corresponding call for contributions issued by the *Meteorologische Zeitschrift* was received very positively and is reflected in the remarkable number (28 papers) published after the full review process. The manuscripts span a wide range of themes related to the interaction of atmospheric flow with complex orography.

Fundamental aspects of mountain flow and the associated challenges of numerically modelling mountain flow were addressed theoretically (e.g. EGGER (I)¹), with synoptic diagnostics (KURZ (II)) and with idealised simulations (ZÄNGL et al. (II); RAKOVEC et al. (II); VRHOVEC et al. (III)). Theoretical and modelling results have been complemented by observational Foehn studies and measurements (e.g. HORNSTEINER and ZÄNGL (I); BEFFREY et al. (II); VOGT (III)). The concomitant evolution of the planetary boundary layer structure has been analysed using MAP lidar and radiosonde data (e.g. BAUMANN-STANZER and GROEHN (II); FRIODUD et al. (III)). The high scientific relevance of these topics is reflected in related research field programmes, such as the recently accomplished project VERTIKATOR² within the German AFO2000 framework that focussed on the boundary layer structure, convection and vertical transport above gentle and steep terrain (cf. EMEIS (I)). Also, MAP findings concerned with gap flow and Foehn have potential to carry over into the ongoing US Rotor Experiment Programme T-REX, first results of which have already been presented at the ICAM/MAP 2003 conference.

A current and pressing issue, especially in mountainous regions such as the Alps, is the challenge of accurate precipitation forecasts, and this theme receives particular attention within the newly established German DFG Schwerpunktsprogramm 1167 “Quantitative Niederschlagsvorhersage”. In this context, the ICAM/MAP community provided a unique environment that fostered the synergy and linkage of researchers, experimentalists and operational forecasters. Their mutual interchange becomes increasingly important as new mesoscale operational models are utilized and drawbacks of parametrizations and model formulations become apparent. Indeed, a number of papers document the sensitivity of forecast models to the quality of the driving (re)-analysis fields (e.g. LASCAUX et al. (I)) and model resolution (e.g. BECK and AHRENS (I); BUZZI et al. (II)). When validating these forecasts,

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¹The roman numbers in brackets indicate the part of the Special Issue in which the papers have appeared.

²VERTIKATOR, <http://www.vertikator-af02000.de/>

there is a clear need for model-independent data control (HÄBERLI (II)). Also, in order to improve precipitation forecasting, it is necessary to further our understanding of moist processes and the water cycle (cf. BERTO (III)), including microphysics, clouds and convection (cf. BERTRAM et al. (III)). Operational expertise in the analyses and use of satellite data for the retrieval of cloud information has been contributed by the DWD; KÄSTNER et al. (III) and BECKER (III), and indicates the potential for operational exploitation of data from future cloud satellite missions (e.g. MSG³ and SAF⁴). The ramifications of these studies relate directly to recent and ongoing international research campaigns to assess predictability and to improve (mesoscale) operational weather forecasts, such as IMPROVE (a post-MAP project on orographic precipitation by the USWRP), and the WWRP THORPEX⁵ initiative that includes a strong European component.

This overview of the ICAM/MAP 2003 contributions is completed by time series analyses of radiosonde data (Haimberger (II)) and climatological analyses in mountainous regions of liquid precipitation (BISCI et al (III); ROEGNVALDSSON and OLAFSSON (III)) and snow (PETKOVA et al. (I); WIELKE et al. (I)), together with wind studies in complex terrain (AGUSTSSON and OLAFSSON (II); IVATEK-SAH DAN and TUDOR (II)) and studies on societal/economic impacts (PARKER (I); FAZZINI et al. (III)).

We hope to have whetted your appetite for the ICAM/MAP Special Issue (3 parts) that, in effect, comprises an impressive anthology of significant contributions in the active research area of wet and dry orographic flow phenomena.

The ICAM/MAP Meeting 2003 was organized by MeteoSwiss and the Institute for Atmospheric and Climate Science of ETH Zurich (IACETH), and co-sponsored by the Swiss Society for Meteorology (SGM), the European Meteorological Society (EMS), and the American Meteorological Society (AMS).

³Meteosat Second Generation, <http://www.esa.int/msg/>

⁴Satellite Application Facilities, <http://www.eumetsat.de/saf/>

⁵THORPEX, <http://www.wmo.int/thorpex/>