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Heavy Precipitation in the Alpine Region (HERA)

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HERA

In ancient Greek mythology wife of Zeus, the god over heaven and earth and generator of all meteorological phenomena, lightning and thunder in particular. Zeus is said to have been much engaged in affairs with other immortal and mortal women (inter alias *with young* Europa). *Hera's influence on the weather and climate is uncertain, but supposedly much greater than accounted for in the ancient myths.*

Editorial

Funding agencies regularly ask for specific deliverables in proposals for research projects. Nowadays these can be quite diverse and comprise, *e.g.*, data catalogues, newly developed computer software, technical guidelines or procedures for routine execution. However, research articles continue to be a basic and a comprehensive form of standard deliverable after the completion of any scientific project.

Nine research institutions from five Alpine countries (cf. page 76 for details) had formed a consortium for carrying out a project entitled ''**He**avy p**r**ecipitation in the **A**lpine region (HERA)'' within the European Commission's research programme ''Environment and Climate''. From December 1996 to March 1999 a large variety of aspects was dealt with in order to come closer to the ultimate aim of areal rainfall determination for flood warnings. To this end a coordinated use was made of *in-situ* measurements, remote sensing and atmospheric modelling across national boundaries.

The main findings from project HERA were first presented in October 1998 to the ''European Climate Science Conference'' in Vienna. After a discussion with the responsible scientific officer of the European Commission, Panagiotis Balabanis, the idea evolved to prepare a collection of refereed articles in a research journal as the final project report to increase the overall ''visibility'' within the scientific and users' communities as well as to clearly document which group tackled which specific task. Project partner Reinhold Steinacker (University Vienna) initiated the contacts with the Editorial Board of ''Meteorology and Atmospheric Physics'' and its publisher, Springer-Verlag (meanwhile he accepted to act as the journal's Managing Editor).

The present volume contains an overview and thirteen specific articles which had been submitted at the project end in March and in revised form till mid-August. As guest editor and project coordinator I want to explicitly acknowledge the large assistance which the common enterprise received during the past years: foremost from all project participants by their dedicated and timely work according to the plans and schedules which we had set ourselves; from the Managing Editor and his collaborators who effectively dealt with all administrative and many editorial matters during the past six months; from all reviewers, who invested time and much consideration to provide the authors with constructive criticism; from the staff of Springer Verlag Vienna and my colleague Winfried Beer, who speeded up the production process by *inter alia* making excellent use of distributed electronic layout systems; from the scientific staff of the European Commission DG XII, notably Anver Ghazi and collaborators, who provided advice and encouragement during the various phases of the project; and last, but by no means least, from all funding bodies, comprising the European Commission (with a 55% share) and all

institutions of the consortium, through the provision of the financial resources (the EU-part of which was smoothly administered by Peter Derkes of DLR's contract management).

To all individuals who patiently endured many pressing requests and who eased the coordination task during the conduct of HERA I am expressing my sincere thanks.

August 1999

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Foreword

Since 1986 the European Commission has been supporting Research and Technological Development (RTD) in the field of natural hazards, with the aim of improving the prediction and mitigation of disasters including floods, earthquakes, landslides, volcanic eruptions and forest fires. The *Environment and Climate Programme* of 4th RTD Framework Programme (1994–1998) placed particular emphasis on natural hazards by promoting a series of basic and applied research projects; thereby contributing to several EU policy objectives as well as to the United Nations *International Decade of Natural Disaster Reduction*. The area of *Hydrogeological Risks* was given particular attention and included projects dealing with radar-based estimation of rainfall, hydro-meteorological modelling, real-time flood forecasting, flood and debris flow risk assessment *etc.* Given that accurate forecasts of precipitation are essential for successful flood prediction and warning, several projects (HERA, MEFFE, HYDROMET, DARTH, TELFLOOD) were funded which focussed on meteorological phenomena and the hydrological cycle as important components and precursors to floods.

The underlying objective of project HERA (**He**avy p**r**ecipitation in the **A**lpine region) was to portray heavy precipitation events in the Alpine region and their subsequent impact on the hydrological cycle. This was achieved through the establishment of a multi-year systematic collection of heavy precipitation episodes by processing combined datasets from ground-based radar, surface and upper air observations. The analysis of major precipitation events was performed by applying operational and research-type numerical weather forecast models and by quantifying the underlying physical processes. Airborne radar algorithms were adapted to conduct measurements over the mountainous terrain, typical of this region. HERA is an example of a successful project, which has brought together expertise and know-how from nine European research institutes sharing a special interest in hazards related with the Alps.

The 5th RTD Framework Programme (FP5; 1999–2002) is continuing the EU research tradition in promoting the research on natural hazards, since in particular floods and hydrogeological risks continue to strike Europe and its inhabitants. FP5 represents a new and improved approach to RTD with the aim of supporting problem-solving, end-user driven applied research with the goal to support EU policies'objectives as, *e.g.*, sustainable development.

I commend the HERA participants and am confident that this publication will be of great interest to the concerned scientific community and the decision makers.

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