



Lessons learnt from field experiments: Inspection of the **ALPEX-PYREX-MAP-COPS** chain

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in memoriam: **Joachim Paul KUETTNER**
21 Sep. 1909 – 24 Feb. 2011

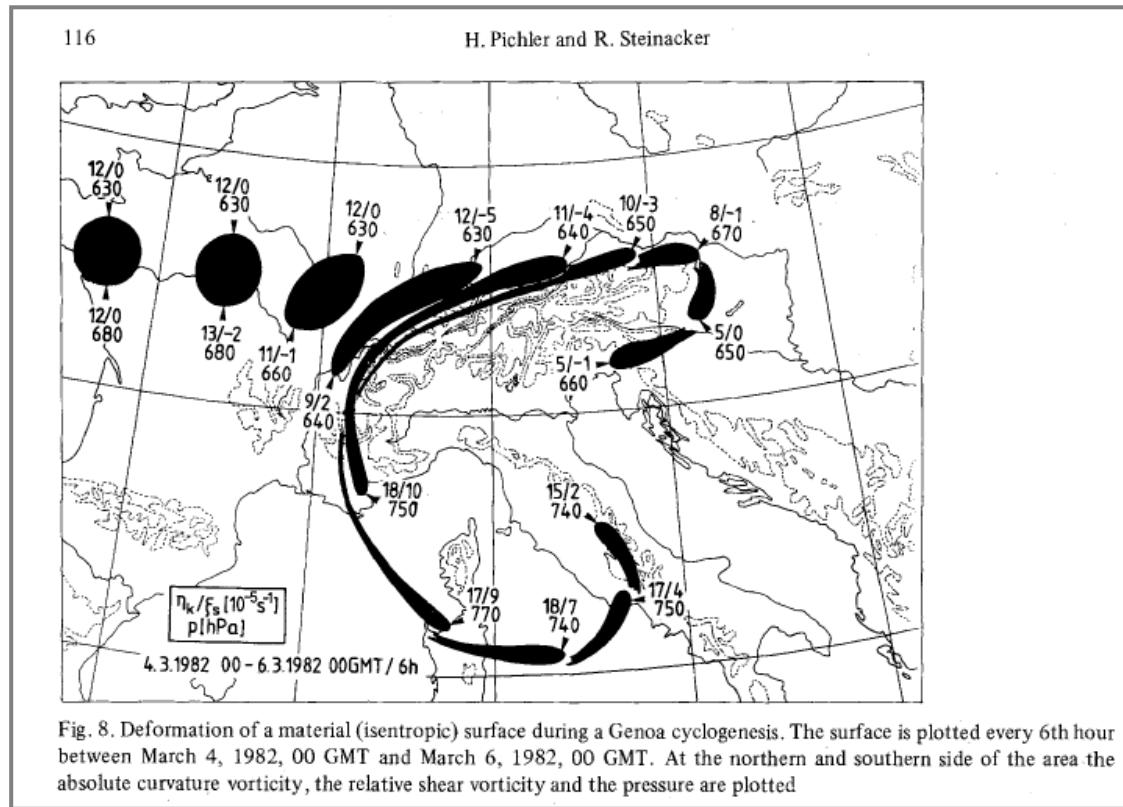
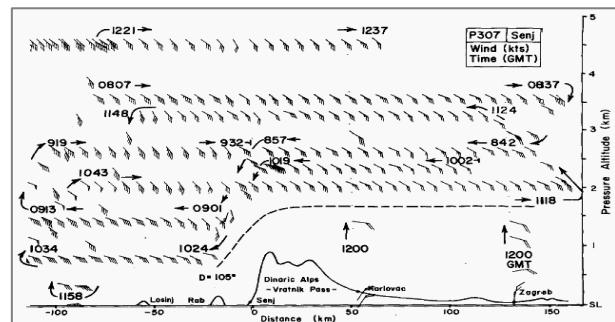


Deutsches Zentrum
für Luft- und Raumfahrt e.V.
in der Helmholtz-Gemeinschaft

ALPEX:

SOP March & April 1982

the arena



a/c obs. of bora flow

air parcel deformation by lee cyclone over 54 h

Results contained in collections/special issues:

- | | |
|--|-------------|
| 1) H. Kraus (ed.), 1984/85 Beitr.Phys.Atmos. 57/58 , interspersed papers after IUGG-1983; | 12 articles |
| 2) ICSU-WMO, 1986: Scientific Results of ALPEX, 2 Vols., GARP Series Nr. 27, WMO, 710pp.; | 58 contrib. |
| 3) E.R. Reiter, J.P. Kuettner (eds.), 1987: Meteor.Atmos.Phys. 36 , 1-296; | 19 articles |
| 4) H.C. Davies, H.Pichler (eds.), 1990: Meteor.Atmos.Phys. 43 , 3-240; (partly → PYREX) | 23 articles |

PYREX:

SOP Oct. & Nov. 1990

the arena

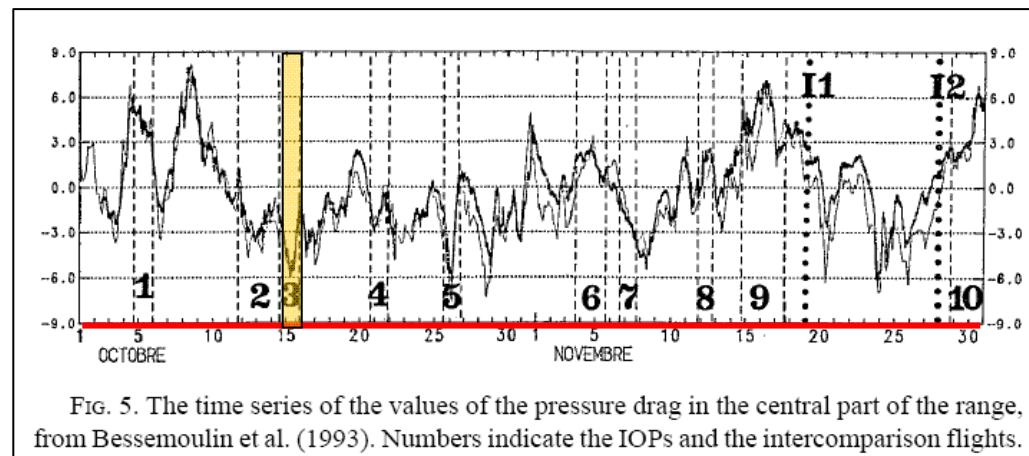
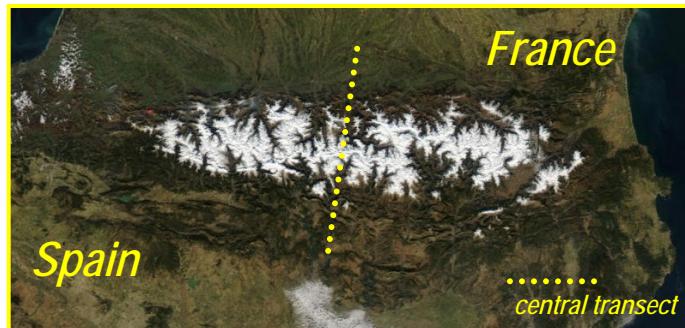


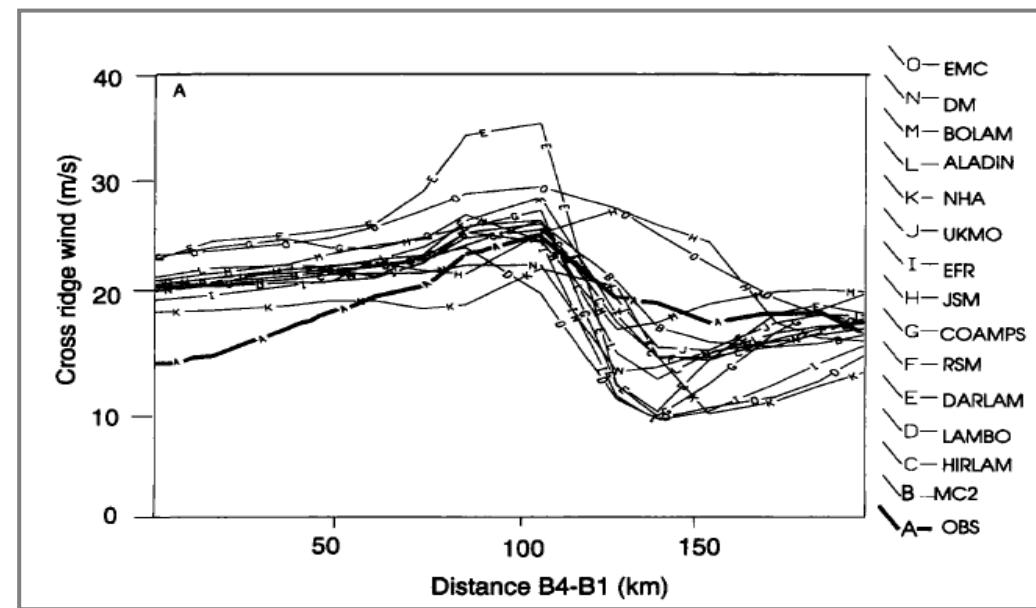
FIG. 5. The time series of the values of the pressure drag in the central part of the range, from Bessemoulin et al. (1993). Numbers indicate the IOPs and the intercomparison flights.

central section pressure drag

selected refs.:

- 1) Bessemoulin et al., 1993: BPA 66, 305-325
- 2) Bougeault et al., 1997: BAMS 78, 637-650
- 3) Georgelin et al., 2000: QJ 126, 991-1029

*Simulated winds too fast,
mountain waves too large*



model comparison: 545 hPa cross-ridge wind

MAP

SOP 7 Sep. - 15 Nov. 1999

the arena

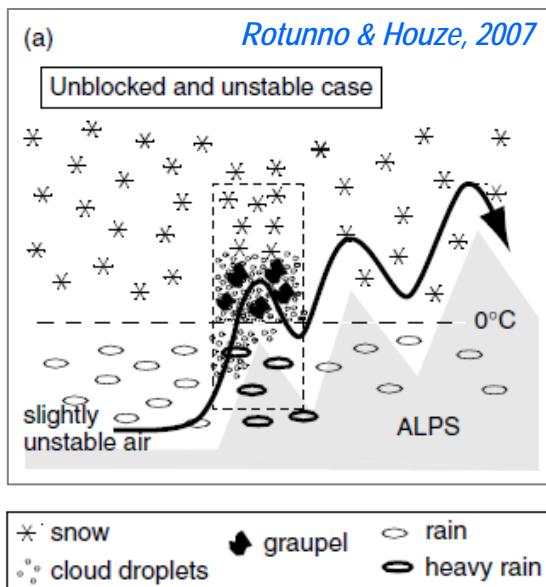
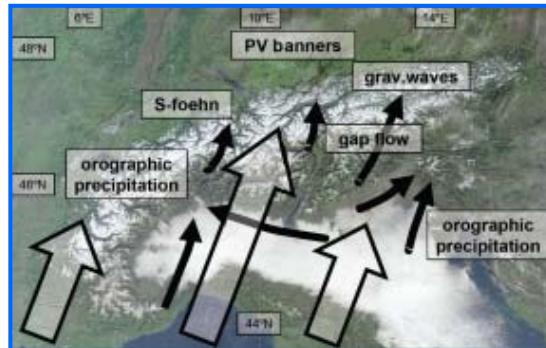


Figure 15. Conceptual model of the airflow and microphysics of orographic precipitation mechanisms in MAP cases of (a) unstable unblocked low-level flow, and (b) stable blocked low-level flow (adapted from Medina and Houze, 2003a).

Results i.a. in collections/special issues:

- 1) Bougeault et al., 2001: BAMS **82**, 433-462
- 2) Bougeault et al. (eds.), 2003: QJ **129**, 341-895;
- 3) Volkert et al. (eds.), 2007: QJ **133**, 809-967;

226 quotes in ISI-art.
25 articles
9 review articles

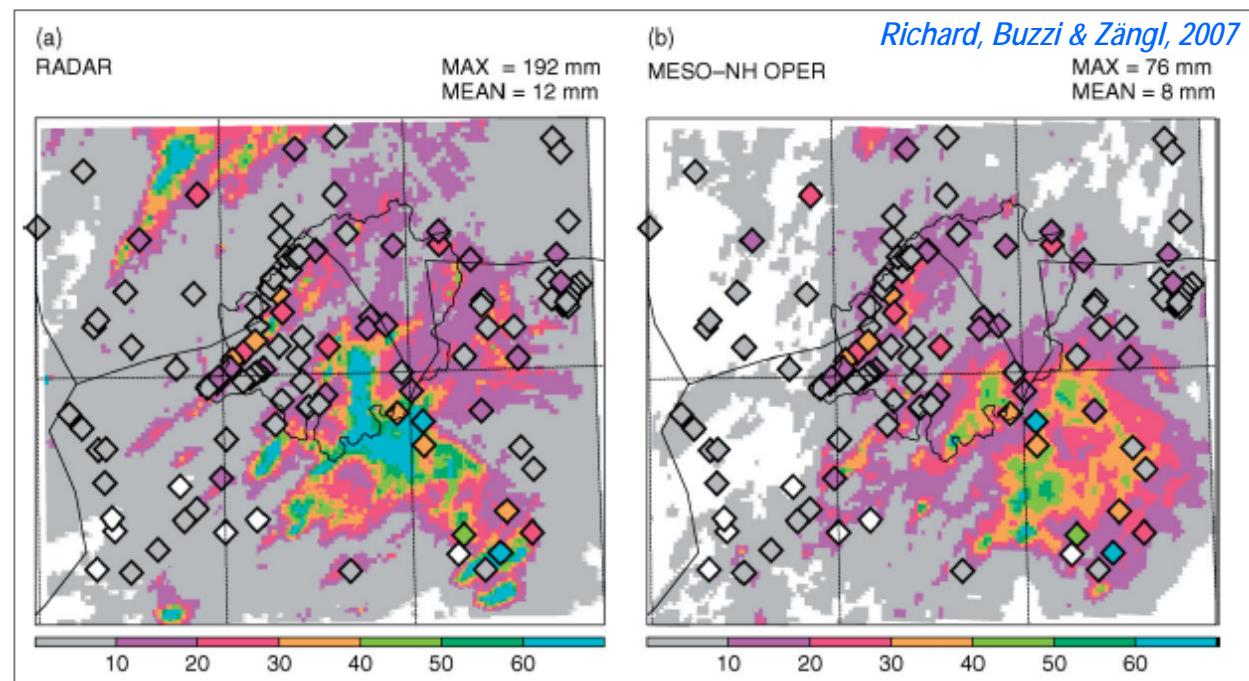
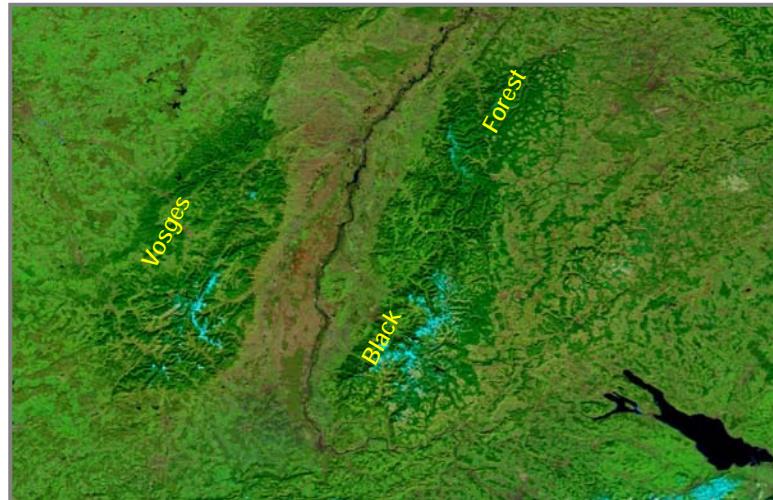


Figure 4. 12-hour accumulated rainfall (mm) at 00 UTC on 18 September 1999 (IOP 2a): (a) Radar-derived precipitation superimposed with raingauge observations (diamonds). (b), (c) and (d) MESO-NH computations with a model suite based upon OPER, MAPRA, and CNTRL analyses, respectively. The thin black lines indicate the Toce-Ticino watershed location, and the political borders between France, Switzerland, and Italy.

COPS

SOP June – Aug. 2007

the arena



IOP 12: 30 July 2007

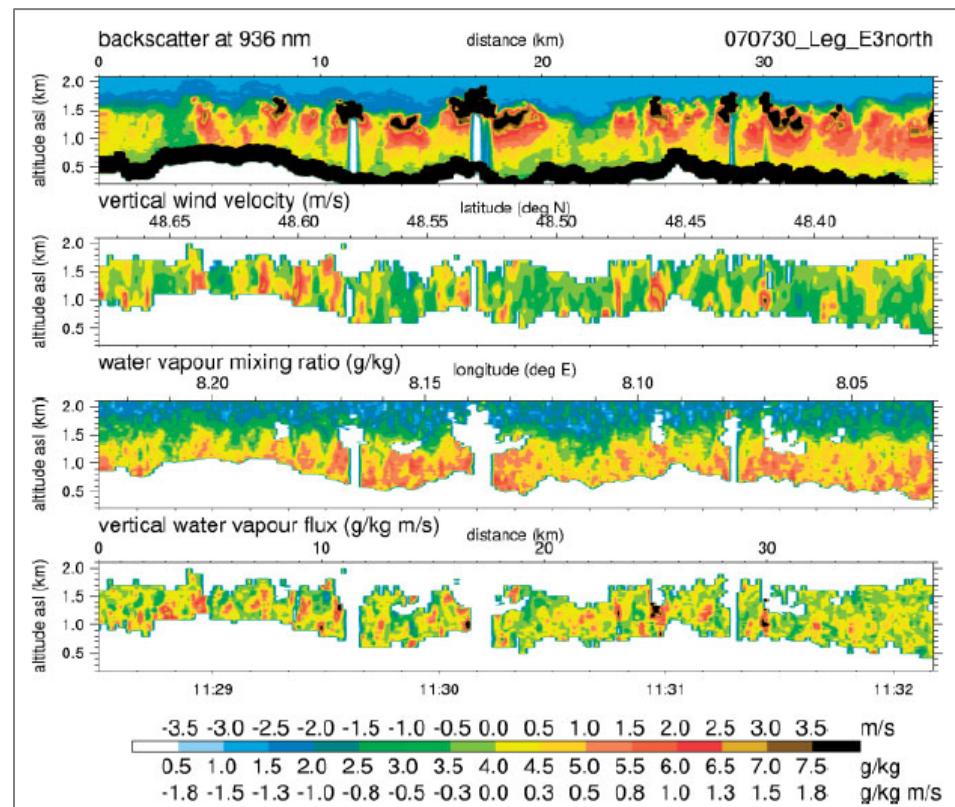
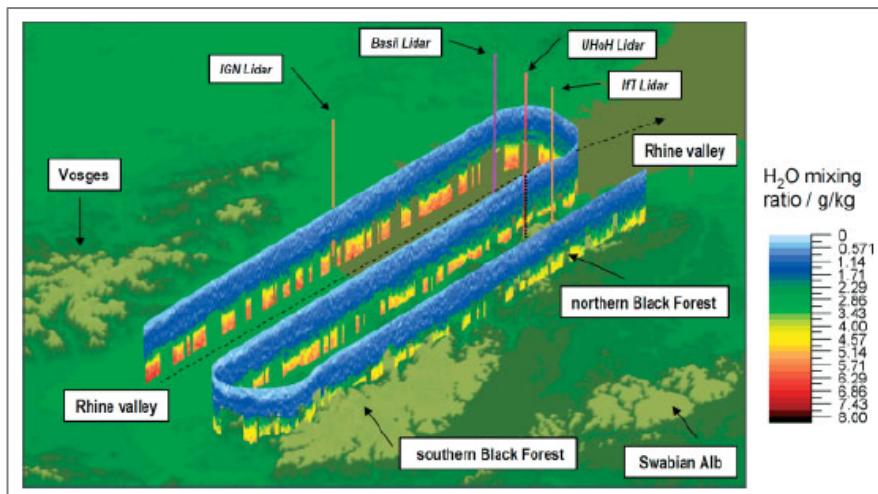


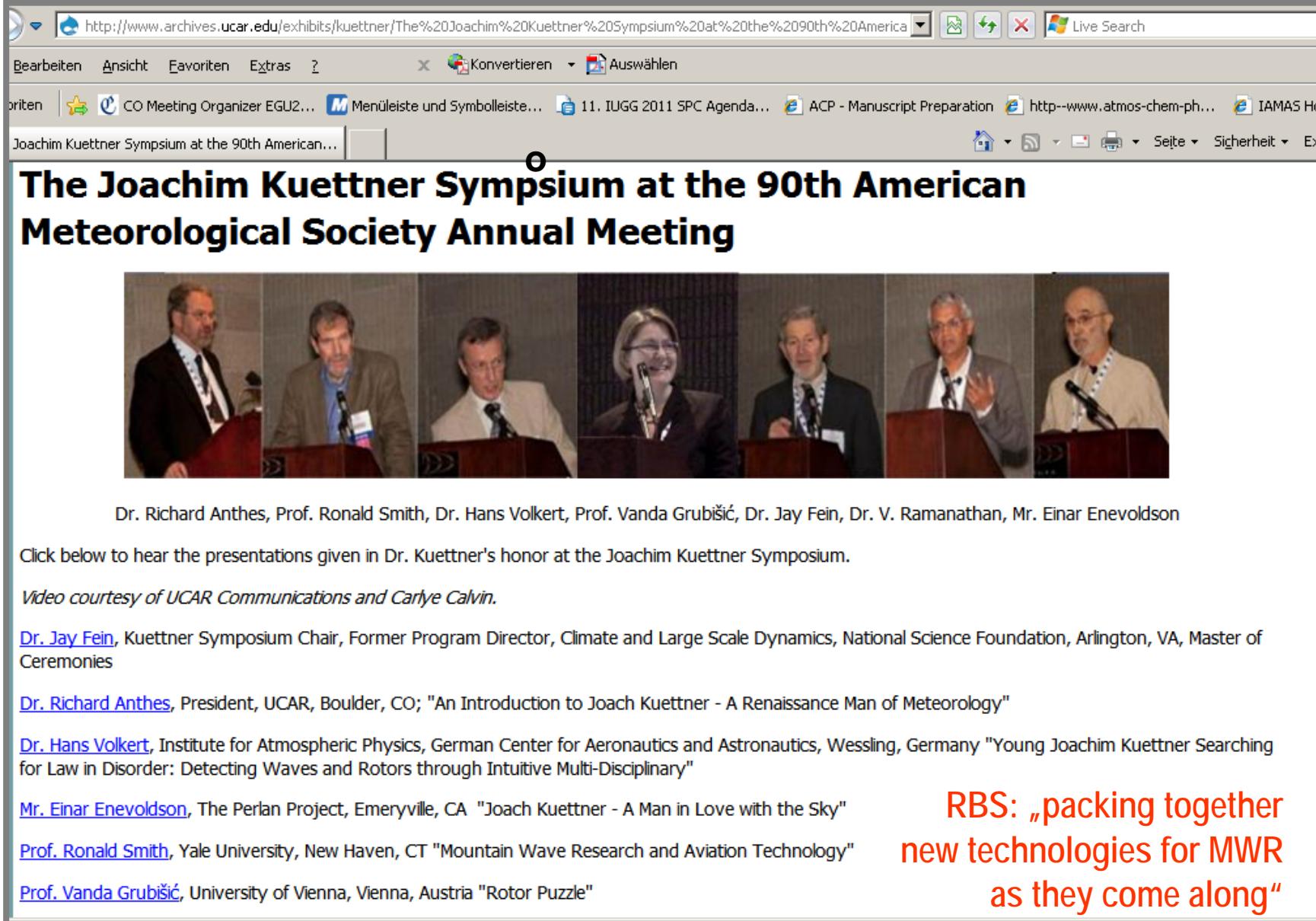
Figure 3. Aerosol backscatter intensity (in arbitrary units; top), vertical motion (updraughts positive), humidity and water vapour flux above the Black Forest on 30 July 2007 over the northern part of flight leg E. The Hornisgrinde Mountain (H in Figure 2) was overflown at 1129 UTC. Local time is two hours ahead. The aspect ratio is ~1:3, the average CBL depth is ~1 km. Convection, cumulus clouds and orographic influences produce an irregularly structured boundary layer. A few intense updraughts generate most of the flux.

Results i.a. in special issue:

Wulfmeyer, Flamant et al., 2011: QJ 137, Suppl.1, 1-348

21 articles

Field experiments with time: extensive videos at www.archives.ucar.edu/exhibits/kuettner



The screenshot shows a Microsoft Internet Explorer browser window. The address bar displays the URL <http://www.archives.ucar.edu/exhibits/kuettner/The%20Joachim%20Kuettner%20Sympsi...>. The title bar of the browser window also contains this URL. The menu bar includes "Bearbeiten", "Ansicht", "Favoriten", "Extras", "Konvertieren", "Auswählen", and "Live Search". The toolbar includes icons for "Home", "Back", "Forward", "Stop", "Refresh", and "Search". The status bar at the bottom shows "Joachim Kuettner Sympsi...". The main content area features a large title "The Joachim Kuettner Symposium at the 90th American Meteorological Society Annual Meeting" in bold black font. Below the title is a photograph of seven people standing behind podiums, all wearing microphones and name tags. Below the photo is a caption: "Dr. Richard Anthes, Prof. Ronald Smith, Dr. Hans Volkert, Prof. Vanda Grubišić, Dr. Jay Fein, Dr. V. Ramanathan, Mr. Einar Enevoldson". A text below the photo reads: "Click below to hear the presentations given in Dr. Kuettner's honor at the Joachim Kuettner Symposium." A note below that says: "Video courtesy of UCAR Communications and Carlye Calvin." Several links are listed below, each with a brief description: "Dr. Jay Fein", "Dr. Richard Anthes", "Dr. Hans Volkert", "Mr. Einar Enevoldson", "Prof. Ronald Smith", and "Prof. Vanda Grubišić". To the right of the list, there is a red text overlay that reads: "RBS: „packing together new technologies for MWR as they come along“".

The Joachim Kuettner Symposium at the 90th American Meteorological Society Annual Meeting



Dr. Richard Anthes, Prof. Ronald Smith, Dr. Hans Volkert, Prof. Vanda Grubišić, Dr. Jay Fein, Dr. V. Ramanathan, Mr. Einar Enevoldson

Click below to hear the presentations given in Dr. Kuettner's honor at the Joachim Kuettner Symposium.

Video courtesy of UCAR Communications and Carlye Calvin.

[Dr. Jay Fein](#), Kuettner Symposium Chair, Former Program Director, Climate and Large Scale Dynamics, National Science Foundation, Arlington, VA, Master of Ceremonies

[Dr. Richard Anthes](#), President, UCAR, Boulder, CO; "An Introduction to Joach Kuettner - A Renaissance Man of Meteorology"

[Dr. Hans Volkert](#), Institute for Atmospheric Physics, German Center for Aeronautics and Astronautics, Wessling, Germany "Young Joachim Kuettner Searching for Law in Disorder: Detecting Waves and Rotors through Intuitive Multi-Disciplinary"

[Mr. Einar Enevoldson](#), The Perlan Project, Emeryville, CA "Joach Kuettner - A Man in Love with the Sky"

[Prof. Ronald Smith](#), Yale University, New Haven, CT "Mountain Wave Research and Aviation Technology"

[Prof. Vanda Grubišić](#), University of Vienna, Vienna, Austria "Rotor Puzzle"

RBS: „packing together
new technologies for MWR
as they come along“

General observations, i.e. „lessons“:

- scientific objectives hardly very strict, but **bundled**;
- processes **combined** rather than separated;
- even large teams are **small** compared to e.g. engineering;
- **,persuasion'** of sponsors takes much time & energy;
- progress often via **subtleties** (which are easily forgotten);
- difficult **integration** between subdisciplines & countries;
- **chain** effect over several campaigns important (every **7 a?**);
- field experiments essential for our **Sisyphos-type** efforts;

- Sisyphos was considered a **happy** person;
- more happiness through **HYMEX** ?!

JPK's closing words on 19 Jan 2010 (end of Wirth's video):

„I didn't expect at all that you would have so much information about things that I have been concerned with, but I would like to tell my conclusion: that if you have the opportunity to collect these little colored **mosaic stones**, one blue, one white, that they may in the end add up as something worthwhile doing, and that is really what I have tried to do in my life. But I have never heard such a combination of talks in which I was involved until I heard it today. As I look back at my friends, those that are still around and those that have left us, I can only say that I feel today

as the **owner** of a beautiful **mosaic**, namely your contributions.“

**Even if all our work is necessarily fragmentary,
fine mosaics do evolve;
field experiments remain an essential ingredient**