



Multi-scale **t**ransport and **e**xchange processes in the **a**tmosphere over **m**ountains – Programme and **e**xperiment

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TEAMx Working Group report 1/2022

- TEAMx in (not even) a nutshell
- TEAMx news
- Working Group **Objectives, Goals & Accomplishments** during Reporting Period

TEAMx – what is it?

Multi-scale **T**ransport and
Exchange Processes in the
Atmosphere over
Mountains
Programme and **e**xperiment

- ...a bottom-up financed research program on weather, climate & air pollution in mountain areas
- in the ‘tradition’ of international mountain meteorology programs (ALPEX, PYREX, MAP → **TEAMx**)
- Institutional ‘crowd funding’ for a Programme Coordination Office (*PCO* - @ UIBK)

TEAMx news

- PCO, Helen C Ward
 - got a prestigious Austrian research project granted
 - her 'successor': the same
 - currently is TEAMx without PCO

Objectives, Goals & Accomplishments during Reporting Period

Goals for 2022:

- updated version of the TEAMx Experimental Plan
 - which has been reviewed by the TEAMx community
 - includes the Plan for the TEAMx Observational Campaign (draft currently in revision)
 - includes the TEAMx Numerical Modelling Plan (first draft currently in preparation)

Experimental plan

State mid 2022:

- A revised draft of the Plan for the TEAMx Observational Campaign was shared via the website in May 2022
- The draft Numerical Modelling Plan is continuing to be developed thanks to the efforts of the Numerical Modelling Committee. However, progress continues to be slow due to a lack of time available to work on this substantial document (PCO!).

Progress on the TOC Plan

- Draft TOC plan is being revised
- Project plans/additional instrumentation (Section 4.2) substantially extended
- Two additional documents: Aircraft Involvement in TEAMx + interactive map (kml)

AircraftFleet_PlansForTEAMx_v2-03.docx

Planned research aircraft involvement in TEAMx

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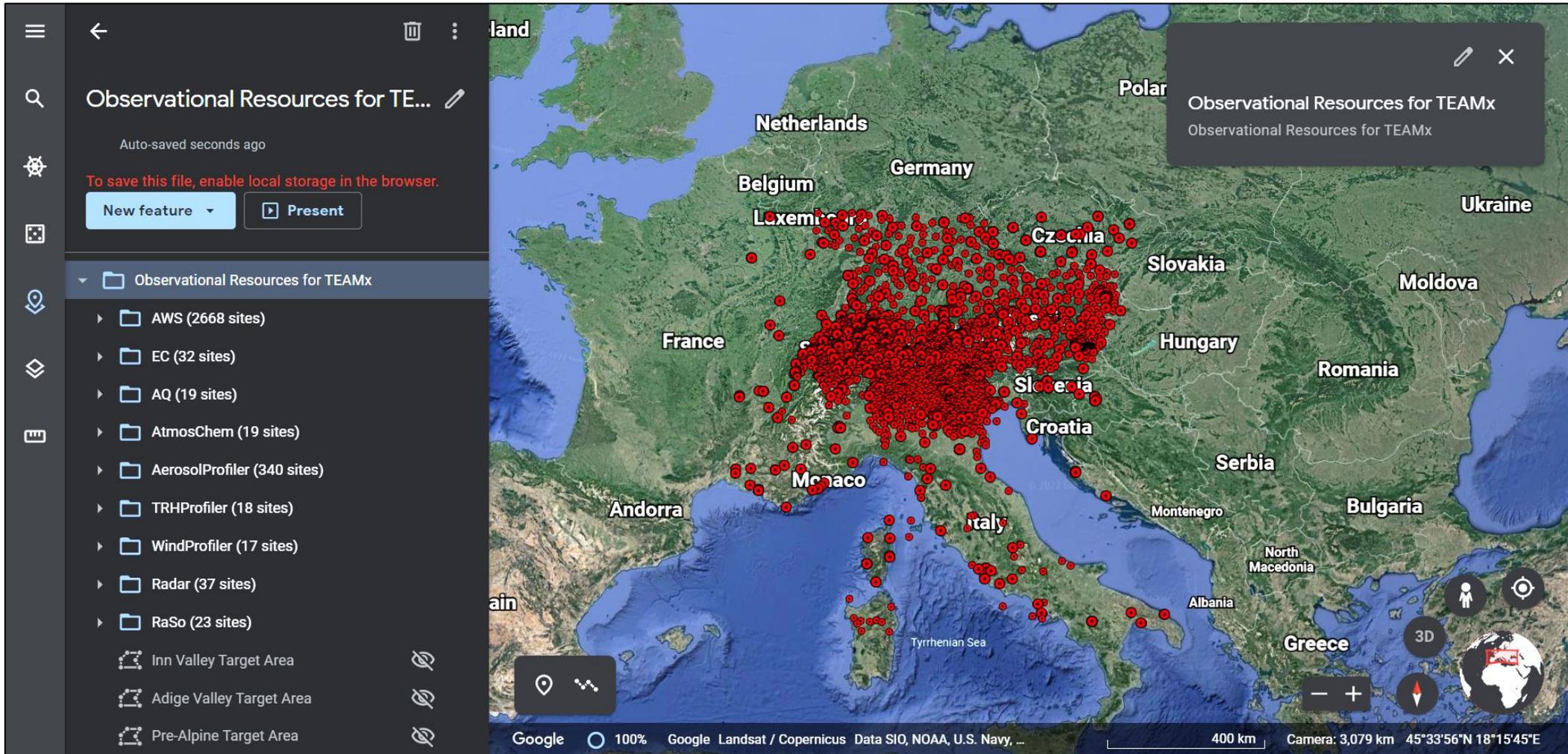
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DRAFT Plan for the TEAMx Observational Campaign

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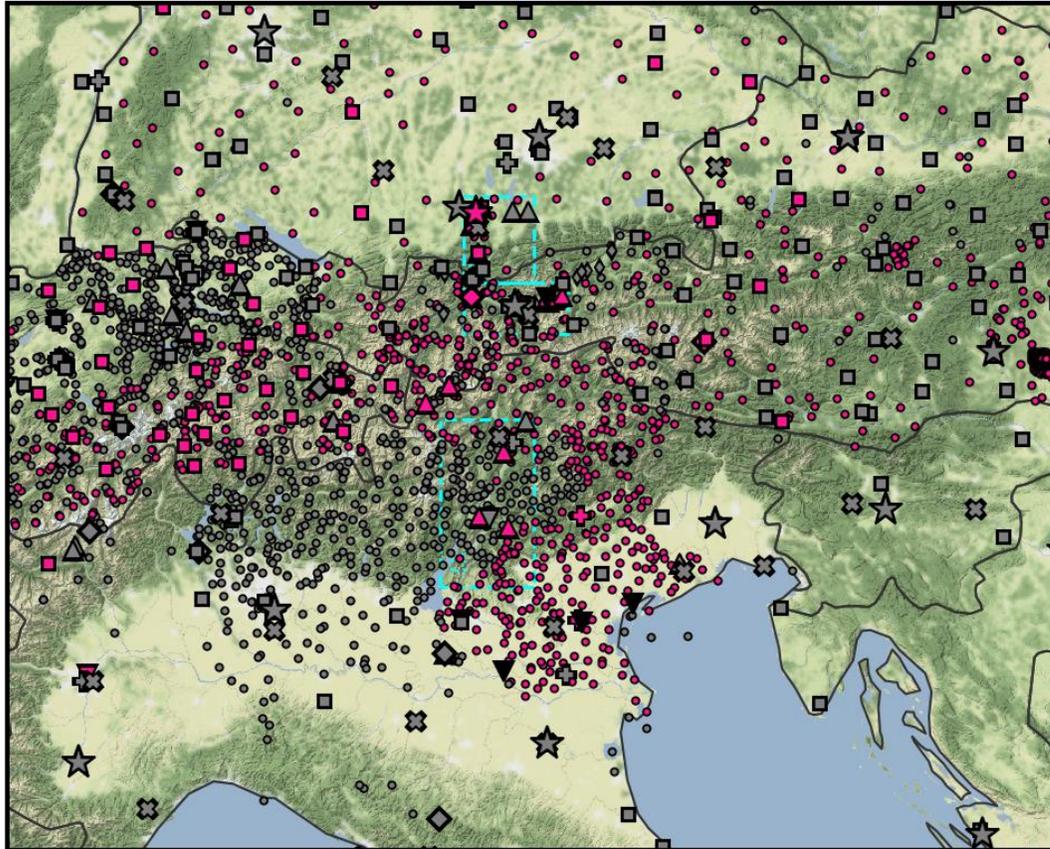
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Interactive map



Existing observational resources

All stations



- Target Area
- Operational site
- Potential site/check data access
- Weather station
- ▲ Flux tower
- ★ Radio-sounding
- + T-RH profiler
- ▼ Wind profiler
- ✕ Radar
- Aerosol profiler
- ◆ Air quality station
- ◆ Atmos. chem. facility

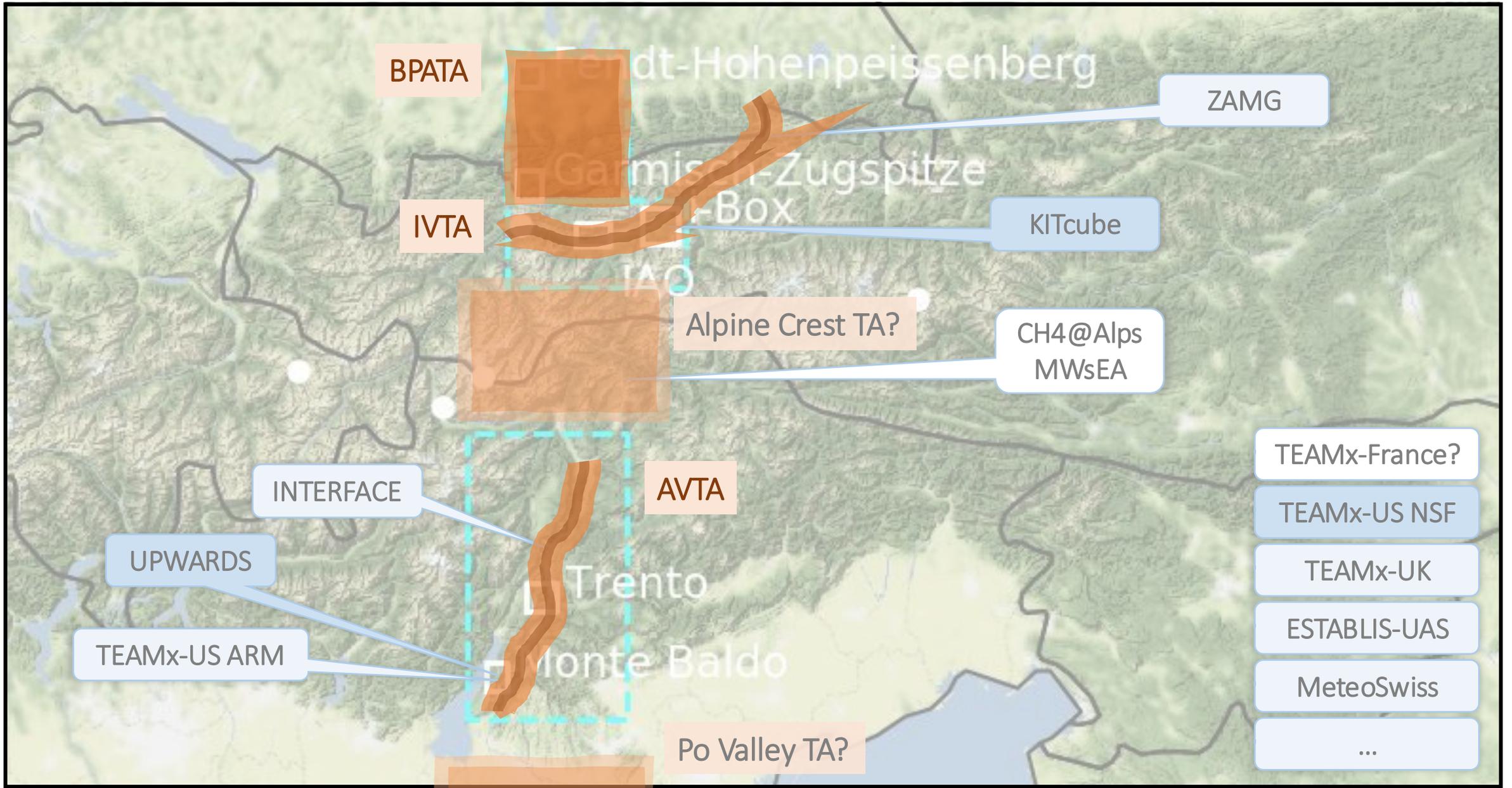
Additional planned deployments for the TOC

- * TEAMx-US NSF proposal plans for the Summer EOP (de Wekker et al --> **subm**)
- * TEAMx-US ARM proposal plans (Kirshbaum et al → **subm**)
- * TEAMx-UK proposal plans (Chemel et al --> **preproposal subm**)
- * TEAMx-France plans (Paci et al)
- ✓ * KITcube plans for the Summer EOP around the i-Box (Andreas, Nevio)
- * UPWARDS project plans at Monte Baldo (Zardi, di Sabbatino --> **submitted**)
- ✓ * INTERFACE project on advection (Giovannini, Tondini, Rotach)
- ✓ * DLR CH4@Alps and MWsEA projects with the Falcon and Rayleigh lidar during the Winter EOP (Gisinger et al)
- ✓ * DLR ESTABLIS-UAS project with a drone swarm and Doppler wind lidars (ERC Wildmann)
- ✓ * Unicorn project plans including funded flights and barographs (ERC, Stiperski)
- ✓ * ZAMG BL profiling plans in the Inn Valley (Baumann-Stanzer)
- ✓ * MeteoSwiss remote sensing station (Hervo)

Additional planned deployments for the TOC

- * TEAMx-US NSF proposal
 - * TEAMx-US ARM proposal
 - * TEAMx-UK proposal
 - * TEAMx-France
 - ✓ * KITcube
 - * UPWARDS (Monte Baldano)
 - ✓ * INTERFACE
 - ✓ * DLR CH4@Alps and MWsEA projects
 - ✓ * DLR ESTABLIS-UAS (ERC Wildmann))
 - ✓ * Unicorn (ERC Stiperski)
 - ✓ * ZAMG BL profiling
 - ✓ * MeteoSwiss remote sensing station
- + many more, including...
- * Raman lidar deployments (Paolo di Girolamo, Hannes Vogelmann)
 - * Helikite measurements in the Inn Valley (Julia Schmale)
 - * Long-distance glider flights (Klaus Ohlmann)
 - * Crest measurements during the Winter EOP (SLF)
 - * Possible tracer experiments
 - * Detailed snow studies
 - * Cold-pool studies
 - * Numerous additional AWS, EC and RS observations
 - * ...
 - * ...

Summer EOP + Winter EOP



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- Organization of the 3rd TEAMx Workshop in mid-2022.
 - postponed to 2023 (due to proposal submission phase)
- Further develop the network of mountain weather and climate research projects. Activity for 2022 will mainly be to systematically expand the information to areas outside Europe and establish forms of communication exchange within the network.
 - collection of 'entries' / no systematic work

Objectives, Goals & Accomplishments during Reporting Period

Other Science Highlights :

- A BAMS Essay paper published
 - overview of the motivation behind TEAMx and the aims of the programme.
- **preliminary campaign** in the Inn Valley presently ongoing
 - testing of instrumentation and exploration of flow phenomena

A Collaborative Effort to Better Understand, Measure, and Model Atmospheric Exchange Processes over Mountains

Mathias W. Rotach, Stefano Serafin, Helen C. Ward, Marco Arpagaus, Ioana Colfescu, Joan Cuxart, Stephan F. J. De Wekker, Vanda Grubišić, Norbert Kalthoff, Thomas Karl, Daniel J. Kirshbaum, Manuela Lehner, Stephen Mobbs, Alexandre Paci, Elisa Palazzi, Adriana Bailey, Jürg Schmidli, Christoph Wittmann, Georg Wohlfahrt, and Dino Zardi

ABSTRACT: In this essay, we highlight some challenges the atmospheric community is facing concerning adequate treatment of flows over mountains and their implications for numerical weather prediction (NWP), climate simulations, and impact modeling. With recent increases in computing power (and hence model resolution) numerical models start to face new limitations (such as numerical instability over steep terrain). At the same time there is a growing need for sufficiently reliable NWP model output to drive various impact models (for hydrology, air pollution, agriculture, etc.). The input information for these impact models is largely produced by the boundary layer (BL) parameterizations of NWP models. All known BL parameterizations assume

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Bild von der Pre-Campaign?

TEAMx Working Group report 2021

....and all the rest is in the document....