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A coordinated effort to investigate Transport and Exchange Processes in the Atmosphere over Mountains

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Mountainous areas contribute in major ways to synoptic-scale and meso-scale atmospheric flows (e.g., orographic precipitation; gravity wave drag; thermally driven flows). Both weather and climate models need to get these processes right. Only recently, we begin to be able to model in a physically consistent manner what traditionally is called 'earth-atmosphere exchange', i.e., the coupling between the surface and the atmosphere – *even over complex mountainous terrain.*

Output of numerical models (NWP) is nowadays used to provide point-specific weather information (weather apps) - what is extremely challenging in mountainous terrain. Increasingly, it is *also* used as input for applied models for, e.g., hydrology health-related forecasts, energy smart-net regulations and potential assessment, economic decision models, agricultural models or ecological budgeting. Similarly, climate services in relation to *climate change* call for our ability to correctly model scenarios for future climate states. Finally, atmospheric composition is not only relevant with respect to climate forcing, but also – on shorter time scales – in view of air pollution. Mountainous terrain does not only trigger its characteristic pollution threats (such as smog episodes in a stably stratified valley) with their feedbacks to Earth-System Services, but also largely increases the complexity by introducing air chemistry as another process that needs to be taken into account.

All these developments make it highly timely to plan and execute – some twenty years after the last major international project on mountain meteorology, MAP - a new internationally coordinated project focusing on the investigation, experimental assessment and numerical modelling of the *exchange of energy, mass, and momentum between 'mountainous terrain' and the free atmosphere at all scales and especially their interactions.* The present presentation summarizes the state of affairs for the corresponding endeavour 'TEAMx' (**T**ransport and **E**xchange processes in the **A**tmosphere over **M**ountains – e**x**periment).