CIMAPEX

COORDINATED
INTER-MONSOON
MESO SCALE AND MOUNTAIN
AREAS
PREDICTION
EXPERIMENT

Proposal by

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Motivation

- High altitude areas exert a large impact on weather and climate at the continental and global scale.
- Operational weather forecasts can adequately resolve and represent circulation in mountain areas with proper datasets.
- Global climate change interacts with regional scale phenomena. It becomes necessary to understand more about local weather changes and about the variation of the water cycle.
- Extreme weather events induced by complex topography and water storage problems have influence not only in the high altitude regions but impact a much wider environment and a high number of people.

General Objectives

CIMAPEx could be a concerted, international and interdisciplinary effort to further the knowledge of physical and dynamical processes in high altitude areas, considering the highest ridges in the world **as a whole**, **analysing at the same time different climate areas**, and to better understand any interaction among global, continental-regional and meso-local scales.

A multi-year numerical modeling phase, with inserted observing periods including **IOPs** and evaluation and intercomparisons among models, could be the basic structure of the project.

Climate and weather aspects

- What is the influence of a fine-resolution, sub-grid representation of topography on the simulated weather and climate?
- A limited ability to simulate orographic circulation and its interaction with larger-scale flow will produce a failure in the forecast on mountain regions. Downscaling techniques necessary.
- The increase of models' spatial resolution needs a high-resolution observational dataset.
- Ensemble predictions to evaluate the predictability of phenomena
- Multi-model ensembles to enhance forecast abilities
- Increase of knowledge in high resolution simulation of weather events in mountain areas may give a benefit to climate studies and regional climate prediction.

Climate and weather aspects II

• Interaction between hydrologists and atmospheric scientists is desirable in order to define the forecast lead time and the accuracy of rainfall predictions

• Design a real-time end-to-end forecast system, demonstrating the potential of operational high-resolution atmospheric models in capturing the relevant processes responsible for heavy precipitation events in complex terrain and detect high-frequency phenomena and their interaction with low-frequency ones.

• A CIMAPEx forecast period during the international monsoon year (2008) could allow the exploiting of synergies in terms of high-resolution atmospheric forecasting, data exchange, observing systems, model (atmospheric and hydrological) evaluation and intercomparison

Links

• GEWEX and especially CEOP may recognize the contribution of possible CIMAPEx activities towards improving the prediction of moist processes over and in the vicinity of complex topography of the high altitude areas, including interactions with land-surface processes.

• An international group could be constituted in the framework of CEOP, GEWEX and WCRP. In complete respect of the new GEWEX roadmap.

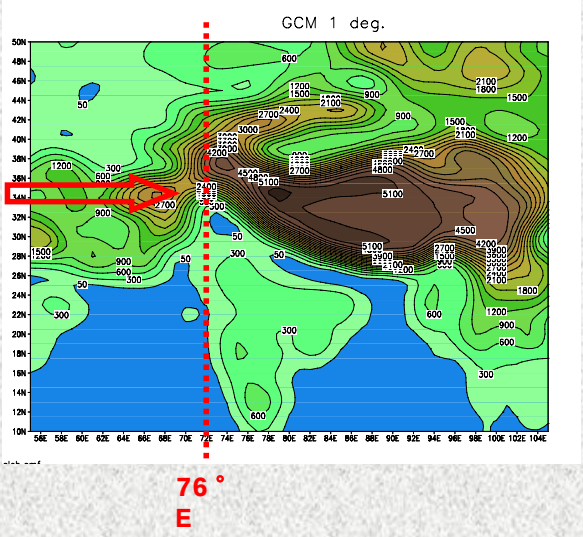
• Climate region communality with AMMA, CPPA, MAHASRI, LBA, LPB

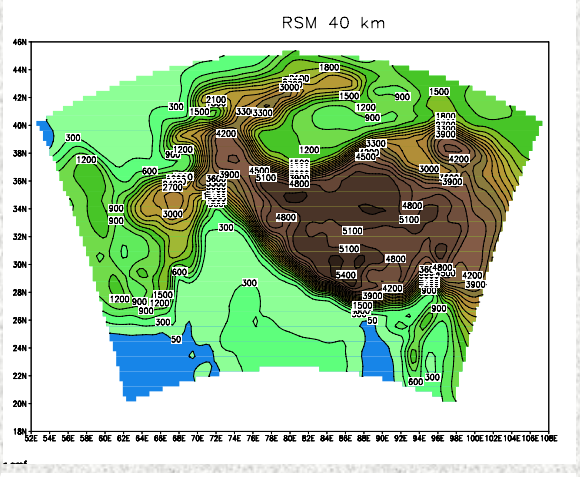
• Possible links to existing and developing projects: CIMS, CLIC, COPES, GLASS, GMPP, HEPEX, MHAI, PEHRPP, RAIMEP, WESP.

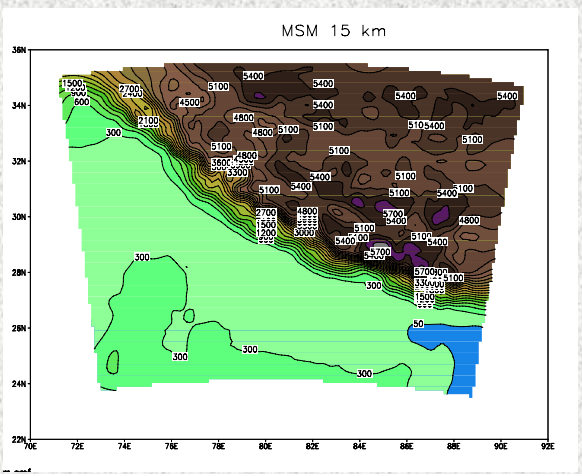
Approximate Time Table

1. definition of globa requirements, participants, design, general organisation, kick-off meeting;
2. implementation of observation strategies for high-resolution observational dataset;
3. prediction systems and high-resolution models ready;
4. definitions of observational sites by means of model simulations to determine their representativity, definitions of strategical areas;
5. start of global observation period finalised to the project objectives;
6. model simulations on high altitude areas; 1st meeting;
7. start of IOP(s) and of model simulations on strategical areas;
8. evaluation and intercomparison of model simulations against observations; 2nd meeting

Models Domains and Topography







The tipical trajectory of the trough is indicated for cases of snow over the Himalayas