

## **Hydrological Balance and its variation over Monsoon areas**

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It is widely recognized that events like droughts have substantial influence on human activities, particularly in areas where water may be lacking for agriculture. To assess the variations of water budget, hydrologists have, since many years, analysed the river discharges related to catchment basins, their seasonal as well as interannual variations. In General Circulation Models, studies were first focused on the "land-surface state" defined by the land wetness. These last years, an important effort is being made in climate modelling community to simulate the river discharges for the largest basins: this has made possible to study the hydrological cycle at a continental scale; simultaneously, the continental water storage is or will be assessed through satellite altimetry or GRACE (Gravity Recovery and Climate Experiment).

A new General Circulation Model has been developed at LMD where an integrated land surface scheme, Orchidee has been introduced. With this model, we have performed simulations of the present climate and of a changing climate due to a greenhouse gas increase, or irrigation. The impact of these anthropogenic changes on the hydrological budget and river discharges over monsoon areas will be analysed, in order to assess our ability to predict the evolution of the hydrological cycle and identify the areas of large uncertainties.

**Wednesday IV (Keynote talk)**