ASWEX project „Climate dynamics and the water cycle“

ASWEX scientist in charge:	Dr. P. Carl
Synopsis:	Low-dimensional intra-seasonal dynamics of the planetary monsoon system of the northern hemisphere found in a ‚small' General Circulation Model (GCM), which are qualitatively confirmed in observational data, raise the classical question again on the share of the atmospheric water cycle in the dynamic organization of the climate system. From the perspective of the qualitative theory of dynamical systems („chaos theory“), but in close connection to observations on the real system, an additional contribution shall be made by means of a new generation of model simulations and data analyses, to clarify the dynamical state of the climate system and its possible evolution under a topologic-geometrical point of view.
Tangible goals:	Tracing of GCM attractors into higher horizontal and vertical model resolutions; extension of data analyses from inter-annual time scales, as focused upon as yet, to intra-seasonal scales, notably for case studies on specific situations in the climatic evolution during the instrumental period; detailed analysis of the thermal stagnation phase since the 1990s and attempt of a decadal projection.
Methods:	Advancement of internal GCM diagnostics aimed at gathering as precise as possible the model analogues of observed intra- and inter-seasonal climate dynamics in their topological contexts; extension of the „dictionary“ of the technique used (Matching Pursuit; MP) by data models that are capable to better approximate higher order modulations and critical transitions or „events“.
External co-operations:	Potsdam Institute for Climate Impact Research (PIK): design of a common project.
Envisaged publications:	Journal papers in the climate dynamics literature and a book project, if indicated, on low dimensional aspects of the dynamics of the planetary monsoon system.
Interfaces:	ASWEX research area „Numerical modelling of environmental systems“ and ASWEX project „Signal analysis“.

References:

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