

No preference

Abstract Title

Planetary feedback cycles of a boreal summer monsoon system

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Study Group

Abstract Text

Topologically most relevant features of an ICM's boreal summer monsoon solution, which exhibits qualitatively correct climate dynamics throughout the season - from the evolution of regional-to-planetary precipitation to the uptake and transport of budgets of integrals of motion that make up its activity cycle – have been made transparent by extensive attractor studies using a dense network of long perpetual-day simulations as the season advances. These studies provide a generalized dynamic perspective, notably in terms of the system's integrals of motion. Here, the necessary completion is given by a more detailed look at the planetary-scale feedback cycles and mechanisms in the back, which remarkably cooperate in generating these generalized views, and in doing so have to cope with substantial intraseasonal changes. A paleoclimatically relevant one, for example, concerns the transition from an orographically excited, pre-monsoon standing oscillation around 30N, which extends over the anticyclones and jets of the northern hemisphere and shows broad teleconnections over areas under suspicion of bearing relationships between Heinrich events and changes in the subtropical monsoon system, to the jet-shifting oscillation of the present-day monsoon. A tropical activity develops in parallel, starting with a 5-days easterly wave that penetrates the Southeastern Pacific to become enhanced in the SPCZ area where this system experiences period doubling and releases 400 hPa westerly winds through a Central Pacific 'duct' each second push, thus exporting 20-days westwards progressing systems toward the Asian monsoon region. In a second bifurcation, this 20-days link establishes the interhemispheric organization of the boreal summer monsoon.

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No conflict of interest

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