



Snow-monsoon relationships in the 1000-year HadCM3 control run and their interaction with remote ENSO forcing

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This paper aims to investigate the predominant mechanisms linking the Asian summer monsoon with Eurasian snow cover in the HadCM3 coupled model. The regions in which boreal winter and spring snow cover have an impact on the subsequent monsoon in the 1000-year control run of HadCM3 are mapped. Possible mechanisms are assessed using analysis of the effects of snow-related soil moisture and albedo anomalies on circulation over Asia and meridional (land-sea) temperature contrasts between the Indian Ocean and Tibetan Plateau. Due to complex interactions of the coupled system between the atmosphere and land or ocean, mechanisms are assessed both in the presence and absence of remote ENSO forcing, including the use of empirical orthogonal functions. Probability density functions (pdfs) of principal component timeseries are perturbed by remote ENSO and snow forcings. Wide variations are shown to exist in the strength of both snow- and ENSO-monsoon teleconnections on multi-decadal timescales.