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Decadal teleconnections between the tropics and the northern hemispheric extratropics in coupled and uncoupled GCM integrations

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A fast coupled climate model (CCM) that consists of the atmospheric general circulation model (AGCM) SPEEDY and the ocean model MICOM is used in a low-order flux-corrected set-up to study teleconnections on the decadal time-scale between the tropical Indo-Pacific region and the extratropics. The flux-correction constrains the CCM's mean SST that is 'seen' by the atmosphere to observed values. The evolution of the variability of the coupled system, however, remains unconstrained. It is found that the decadal tropical Pacific teleconnections with the North Atlantic Oscillation and other modes of northern hemispheric atmospheric variability are considerably stronger in the coupled integration as compared with AGCMs forced with observed sea-surface temperature anomalies. Such strong teleconnections have been previously found in observational data. The nature of these teleconnections is further investigated performing idealized experiments by forcing single components of the coupled system by boundary conditions given by the other.