

## **Dynamic coupling between stratosphere and troposphere simulated with the EMAC-FUB chemistry climate model under present and future conditions**

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It is of major importance to determine the role of the interaction between stratosphere and troposphere in particular to assess the impact of a changing stratosphere on surface climate and weather. Especially on climate time scales changes in tropospheric variability are associated with stratospheric variability. Thus, next to naturally forced components of stratosphere-troposphere-coupling anthropogenically induced contributions are important to be isolated.

The dynamical stratosphere troposphere coupling is explored with the EMAC-FUB chemistry climate model through northern annular mode patterns analysis. A robust relationship is found between the strength of the northern hemisphere stratospheric polar vortex and the mid-latitude tropospheric jets in line with observations for the period between 1969 and 1999. However, the northern hemisphere coupling between stratosphere and troposphere is too long lasting in the model.

EMAC-FUB transient simulation for the period until 2100 with trace gas projections and modelled sea surface temperatures is performed to see what the model predicts for future behaviour of stratospheric – tropospheric coupling. Moreover, a sensitivity study with enhanced greenhouse gas concentrations under current climate conditions is carried out in order to assess the consequences of anthropogenic contribution to coupled dynamic atmospheric variability. Results of northern annular mode changes calculated from the model output will be shown.