



The influence of zonally varying radiation perturbations in the stratosphere on Rossby wave developments

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Generally, externally forced radiative perturbations in the stratosphere (e.g. forced by variations in solar activity) may have a much stronger effect on tropospheric and stratospheric wave activity, if the distributions of ozone and other absorbers are zonally varying, in comparison to constant zonal mean distributions of ozone and other absorbers. This can be expected based on simplified model calculations which show that externally forced zonal variations of the stratospheric polar vortex have a strong influence on the tropospheric wave activity via configuring the diffluent/confluent flow in the upper troposphere / lower stratosphere region. In order to elucidate this process, we have performed sensitivity studies with the GCM MAECHAM5 to compare the effects of radiation perturbations related to zonal mean and zonally varying ozone distributions on the dynamics of the troposphere and stratosphere. Especially, the results reveal induced changes in the distribution of Rossby wave breaking events.