



## **Sensitivity studies on the dynamical transfer of the 11-year solar signal into the Troposphere**

**A. Kubin**(1), U. Langematz(1), K. Matthes(1,2), K. Nissen(1) and Ch. Brühl(3)

(1) Institut für Meteorologie, Freie Universität Berlin, Berlin, Germany, (2) Atmospheric Chemistry Division, National Center for Atmospheric Research, Boulder, Colorado, USA, (3) Max-Planck-Institut für Chemie, Mainz, Germany

The transfer of the 11-year solar signal from the upper into the lower stratosphere was suggested to occur via dynamical processes involving changes of the residual mean meridional circulation (Kodera and Kuroda, 2002). This mechanism has been confirmed recently in a general circulation model study (Matthes et al., 2004). The goal of the work presented here is to investigate the downward transfer of the solar signal into the troposphere in more detail. We conducted systematic sensitivity studies motivated by the work of Thuburn and Craig (2000) using the middle atmosphere ECHAM5 MESSy climate model. A mechanistic momentum force was imposed on the stratosphere in order to investigate the potential impact of an enforced or diminished residual mean meridional circulation on the troposphere. Initially, a zonally symmetric force which reaches its maximum in the midlatitudes was included in the model. Thereafter a time dependent force was introduced, reaching its maximum value in the midlatitudes in midwinter and vanishing during the summer season. The tropospheric response to the stratospheric forcing will be discussed.