

## **A blocking view of stratosphere – troposphere coupling**

Daniela I.V. DOMEISEN<sup>1</sup> and Olivia ROMPPAINEN-MARTIUS<sup>2</sup>

<sup>1</sup> *GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany*

<sup>2</sup> *Oeschger Centre for Climate Change Research and Institute of Geography,  
University of Bern, Bern, Switzerland*

Atmospheric blocking has been related to anomalous eddy heat and momentum fluxes and – by its comparably long persistence as compared to other tropospheric weather phenomena and by its longitudinal structure – blocking is suggested to be connected to stratospheric variability, in particular stratospheric sudden warming events. These events both require and induce anomalous heat fluxes in the troposphere before and after their occurrence.

This study investigates the relationship between blocking, anomalous wave breaking, and stratospheric variability in an idealized dynamical core model by evaluating the role of blocking in stratospheric wave breaking and stratospheric sudden warming (SSW) events. In particular, a significant change in midlatitude blocking is observed before the occurrence of a SSW event, while a change in polar blocking can be observed after the SSW occurrence. These anomalies are strongly related to the dominant annular mode responses observed in the troposphere after a SSW occurrence.

Key words: stratosphere – troposphere coupling, atmospheric blocking, wave breaking, annular modes