



Contribution ID: 51

Type: **Poster presentation**

## **Influence of sudden stratospheric warmings on tropospheric winds**

It is concluded, from piecewise potential vorticity (PV) inversion in isentropic coordinates (Hinssen et al., 2011), that changes in the stratospheric potential vorticity distribution, associated with a Sudden Stratospheric Warming (SSW), may result in substantially less westerly or more easterly winds in the mid-troposphere at middle to high latitudes. During a major SSW, such as the major SSW in January 2009, the positive zonal mean stratospheric polar cap PV-anomaly is replaced by a negative zonal mean stratospheric polar cap PV-anomaly. PV-inversion demonstrates that the amplitude of the tropospheric response to an SSW depends on the amplitude of the positive stratospheric polar cap PV-anomaly prior to the SSW and also on the degree of meridional PV-mixing. A comparison of years with and years without an SSW leads to the conclusion that the change in the zonal mean tropospheric zonal wind velocity, due to the SSW, can be as large as  $-5$  m/s and that this change can easily persist until the end of the winter.

### Reference

Y. Hinssen, A. van Delden and J. Opsteegh, 2011: Influence of sudden stratospheric warmings on the tropospheric winds. *Meteorologische Zeitschrift*, 20, 259-266.

**Primary author:** Dr VAN DELDEN, Aarnout (Utrecht University)

**Presenter:** Dr VAN DELDEN, Aarnout (Utrecht University)

**Session Classification:** Poster session

**Track Classification:** Workshop: Stratospheric predictability and impact on the troposphere