

Home

Online Library ACP

- Recent Final Revised Papers
- [Volumes and Issues](#)
- Special Issues
- Library Search
- Title and Author Search

Online Library ACPD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper

Impact
Factor
4.927

ISI
indexed



[Volumes and Issues](#) [Contents of Issue 2](#)

Atmos. Chem. Phys., 10, 707-718, 2010

www.atmos-chem-phys.net/10/707/2010/

© Author(s) 2010. This work is distributed under the Creative Commons Attribution 3.0 License.

Planetary wave activity in the polar lower stratosphere

S. P. Alexander¹ and M. G. Shepherd²

¹Australian Antarctic Division, Kingston, Tasmania, Australia

²Centre for Research in Earth and Space Science, York University, Toronto, Canada

Abstract. Temperature data from the COSMIC GPS-RO satellite constellation are used to study the distribution and variability of planetary wave activity in the low to mid- stratosphere (15–40 km) of the Arctic and Antarctic from September 2006 until March 2009. Stationary waves are separated from travelling waves and their amplitudes, periods and small-scale vertical distribution then examined. COSMIC observed short lived (less than two weeks and less than 5 km vertically) but large enhancements in planetary wave amplitudes occurring regularly throughout all winters in both hemispheres. In contrast to recent Arctic winters, eastward wave activity during 2008–2009 was significantly reduced during the early part of the winter and immediately prior to the major SSW. The eastward waves which did exist had similar periods to the two preceding winters (~16–20 days). A westward wave with zonal wavenumber two, with distinct peaks at 22 km and 35 km and period around 16–24 days, as well as a stationary wave two were associated with the 2009 major SSW. In the Southern Hemisphere, the height structure of planetary wave amplitudes also exhibited fluctuations on short time and vertical scales superimposed upon the broader seasonal cycle. Significant inter-annual variability in planetary wave amplitude and period are noticed, with the times of cessation of significant activity also varying.

[Final Revised Paper](#) (PDF, 2784 KB) [Discussion Paper](#) (ACPD)

Citation: Alexander, S. P. and Shepherd, M. G.: Planetary wave activity in the polar lower stratosphere, Atmos. Chem. Phys., 10, 707-718, 2010. [Bibtex](#) [EndNote](#) [Reference Manager](#)

Copernicus Publications
The Innovative Open Access Publisher

Search ACP

Library Search

Author Search

News

- [New Tax Regulation for Service Charges](#)
- [Sister Journals AMT & GMD](#)
- [Public Relations & Background Information](#)

Recent Papers

01 | ACP, 01 Feb 2010:
Source attribution and interannual variability of Arctic pollution in spring constrained by aircraft (ARCTAS, ARCPAC) and satellite (AIRS) observations of carbon monoxide

02 | ACP, 01 Feb 2010:
Global estimates of CO sources with high resolution by adjoint inversion of multiple satellite datasets (MOPITT, AIRS, SCIAMACHY, TES)

03 | ACPD, 01 Feb 2010:
Cloud albedo increase from