



Simulations of the gravity wave field in the lower stratosphere during VORCORE

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The Vorcore experiment (Sept. 2005-Feb. 2006, Hertzog et al, *J. Atmos. Ocean. Techno.*, 2007) consisted of 27 flights of superpressure balloons in the lower stratosphere, in the Southern Polar vortex. The quasi-Lagrangian measurements have provided a unique database for the study of the gravity wave field due to the wide domain covered, the duration of the experiment and the quasi-Lagrangian nature of the measurements (giving direct access to intrinsic frequencies). In complement to this observational campaign, high-resolution ($dx = 20$ km) simulations using the Weather Research and Forecast model have been carried out which describe the flow in a wide domain ($10,000$ km \times $10,000$ km) above Antarctica and the Southern Ocean.

At the altitudes of the balloon flights (around 16 and 19 km), the simulations are compared to the observations in two ways: comparison of the averaged characteristics of the gravity wave field (momentum fluxes, intermittency) on one hand, and case studies of particularly intense wave packets on the other. This comparison shows that the simulations reproduce a fair portion of the gravity wave motions, though generally underestimating the amplitudes of the waves. The simulations are then used to explore further and at different heights the characteristics of the gravity wave field (spatial distribution, large scale wakes of topographies, intensities and associated fluxes, intermittency). Particular attention is paid to the differing characteristics of the gravity wave field above topographies (more intense but more intermittent) and above the oceans or flat terrain.