Activity of convective tropical gravity-waves above the South-West Indian Ocean

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Tropical gravity waves play an important role in the dynamics of the middle atmosphere. Such small-scale waves can transport energy and momentum vertically as well as horizontally from the troposphere to the middle and upper atmosphere affecting the global circulation. Recent studies have focused on the characterization of gravity-waves from local and global observation to improve numerical modelling in terms of parameterisation and comparison for more realistic outputs. Many studies have used high-resolution radiosoundings but first climatologies concern continental regions such as Australia and the US (Allen and Vincent, 1995; Wang and Geller, 2003). In the tropics and over ocean, and especially in the South-West Indian Ocean, measurements are scarce and little is known about the activity of the gravity-waves except using satellite data for large-scale gravity waves above the lower stratosphere. In this study, a climatology and spatial distribution of the gravity-wave activity for the South West Indian Ocean is produced. The dataset includes measurements of daily soundings in the South-West Indian Ocean located between 4°S-30°S and 30°E-56°E. Waves parameters (energy, spatial and temporal scales of waves, direction of horizontal wave propagation) are analyzed from January 1998 to November 2005 in the troposphere and lower stratosphere. A daily activity and wave sources (tropical cyclones, QBO, convection...) are also investigated.