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Activity of tropical gravity waves above the South West Indian Ocean

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Tropical gravity waves play an important role in the dynamic of middle atmosphere because they can transport energy and momentum vertically as well as horizontally from the troposphere to the middle and upper atmosphere.

Spectral characteristics and activities of gravity waves can be analyzed using vertical profiles of temperature, zonal and meridional winds. Many studies have been undertaken using high-resolution radiosoundings but first climatologies concern continental regions such as Australia and the United-States (Allen and Vincent, 1995; Wang and Geller, 2003). In the tropics, especially in the South West Indian Ocean, measurements are scarce and little is known about the activity of the gravity waves.

We propose in this study to produce a climatology and spatial distribution of the gravity waves activity for the South West Indian Ocean. The dataset includes measurements of daily soundings for six stations located between 4°S and 30°S of latitude and between 30°E and 56°E of longitude. Waves parameters (energy, spatial and temporal scales of waves, direction of horizontal wave propagation...) are characterized from January 1998 to November 2005 in the troposphere and lower stratosphere. Wave sources are also examined in relation with convection (activity of tropical cyclones...), the QBO...