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Infrasound monitoring and global atmospheric dynamics

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The development of the Infrasound International Monitoring System, used for the verification of the Comprehensive Test Ban Treaty, offers a powerful way to measure, atmospheric waves permanently and at a global scale. Infrasonic waves propagate in the channel formed by the temperature and wind gradients of the atmosphere. Long term observations provide information about the evolution of the propagation conditions and then of atmospheric parameters. The monitoring of continuous sources, as ocean swell, gives the characteristics of the stratospheric wave duct submitted to stratospheric warming effects. Large scale gravity waves, which are also observed by the network, produce a forcing of the stratosphere at low and middle latitudes and long-lived changes in the stratospheric circulation towards high latitudes, leading to fluctuations in the strength of the polar vortex. These fluctuations move down to the lower stratosphere with possible effects on the tropospheric temperature. Gravity wave monitoring in Antarctica reveals a gravity wave system correlated with the wind and the temperature gradients in the stratosphere. Gravity waves associated with magnetic storms are generally not observed. However, wave systems coming from North could reveal other processes related with the global dynamics of the stratosphere.