



Tropical cyclone as the new gravity waves source through Atmosphere-Ionosphere system

L. B. Vanina-Dart , E. A. Sharkov , I. V. Pokrovskaya

Space Research Institute, Moscow, Russia (vandart@iki.rssi.ru / Fax: +7(495)913-30-40 /
Phone: +7(495)333-53-44)

It is known that in the ionosphere, gravity waves influence the speed of ionization at any given point. This occurs because of changes under their influence of neutral gas density and, probably, a stream of ionising radiation reaching the given point. The vertical stream of energy from the troposphere is sufficient to explain the observable amplitudes of internal gravitational waves in the top atmosphere. Waves extend upwards on an inclined direction. Therefore effects in the top atmosphere can be shown not only for many hundreds of kilometres from a tropospheric source, but also in some days after the occurrence. One of intensive sources of such waves can be TC - a tropical cyclone. Waves arising at it can reach the top ionosphere.

This paper presents the special processing results of rocket-borne measurements of the electron density in the equatorial ionospheric D layer over the troposphere catastrophes (tropical cyclones) area at the rocket testing ground Tumba (8⁰ N, 77⁰ E, India) in 1979-1988 . We suppose that the wide-spread influence of tropical cyclone is carried in the wide latitude zone. Remote sensing observations for tropical cyclones were performed over the Indian Ocean and the West North Pacific Oceans.

It was detected that possible large-scale response of ionospheric state can be the “fast” depletion (can be in 4 times(!)) in electron density at heights of 50 – 80 km during the action of the active phase of a tropical cyclone. It is the first observed finding of the “high-rate” action on ionosphere layer by troposphere intensive vortical systems.