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GLOBAL (3D) PATTERN OF THE LARGE-SCALE AGW EFFECTS IN THE UPPER IONOSPHERE ASSOCIATED WITH AURORAL ACTIVITY

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The global (3D) picture of the ionospheric effects of large-scale acoustic gravity waves (AGWs) is being constructed on the basis of an analysis of ground based and topside ionospheric sounding (Intercosmos-19 satellite), together with SuperDARN data in relation to several intense substorms. Variations in the ionospheric parameters hmF2, NmF2, and Ne in the topside ionosphere caused by AGW are investigated. Super-DARN network was used to observe the sudden increase in the ionospheric electric fields and investigate a possible source of AGW. Evidence is presented that during intense storms AGW effects can spread across the whole ionosphere, cover all latitudes, longitudes and heights from hmF up to 900-1000 km. The role of Joule heating in the region of both auroral electrojets and a dayside cusp in the generation of AGWs is also analyzed. It is shown that an unbroken wave front moves evenly for all local time sectors away from the heating source in the dayside cusp region. A strong connection between variations in ionospheric parameters and auroral indices AE, AU and AL is demonstrated for all local time sectors. The functional dependence of AGW effects in hmF2 and NmF2 on the local time is characterized.