

# Inhibition of the F3 layer at low latitude station Sanya during geomagnetic storms in the summer of 2012-2013

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In southernmost of China (dip latitude 12.6°N), inside the equatorial ionospheric anomaly (EIA) region, A DPS-4D digisonde has been equipped and operated since April 2011. Here we report a new feature regarding the low latitude F2 layer stratification based on the 2-year Sanya data. Although the mechanism of the low-latitude F3 layer during geomagnetic storm is mainly attributed to the prompt penetration electric field, we do not know the comprehensive storm effect on the occurrence of the F3 layer. This work attempt to give the storm time behaviour of the F3 layer through analysing the manually scaled ionogram records measured by a Lowell DPS-4D ionosonde operated at Sanya (18.3° N, 109.6° E) to explore F3 layer evolution occurred during 12 small, moderate to strong ( $-45\text{nT} \leq \text{Dst}_{\text{min}} \leq -117\text{nT}$ ) geomagnetic storms in the summer of 2012-2013. Common features in these cases illustrate that, accompanying falling of the peak electron density of F-layer ( $N_{\text{max}}$ ), the height of F-layer ( $H_{\text{max}}$ ) is depressed significantly and the F3 layer occurrence was totally inhibited during the geomagnetic storm events. The main contributor of this phenomenon could be most probably due to the westward wind disturbance dynamo electric field. Even small geomagnetic storms can produce significant changes of the ionospheric profiles at low latitude station. The results are expected to enhance our knowledge about the characteristics of the F layer stratification phenomenon on equatorial aeronomy, although it has been investigated for years.