Equatorial and low latitude ionospheric effects during sudden stratospheric warming events

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The sources of ionospheric forcing are from above (solar and magnetospheric forces), internal (chemistry, local neutral dynamics), and from below (lower atmosphere). In this work we review the observed ion-neutral coupling effects at equatorial and low latitudes during large meteorological events called sudden stratospheric warming (SSW). Research in this direction has been accelerated in recent years mainly due to: (1) extensive observing campaigns, and (2) solar minimum conditions. The former has been instrumental to catch the events before, during, and after the peak SSW temperatures. The latter has permitted a reduced forcing contribution from above and internal. The main ionospheric effects are clearly observed in the zonal electric fields (or vertical **E**x**B** drifts), total electron content, and peak electron densities. We include results from different ground- and satellite-based observations, covering different longitudes and years. We also present and discuss the modeling efforts that support most of the observations. Given that SSW can be forecast with a few days in advanced, there is potential for using the connection with the ionosphere for forecasting the occurrence and evolution of electrodynamic perturbations at low latitudes, and sometimes mid latitudes, during arctic winter warmings.

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