

## Summer-winter hemispheric asymmetry of sudden increase in TEC and O/N2 ratio: Solar activity dependence

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Sudden increase in TEC (SITEC) caused by solar flare depends on solar zenith angle (SZA) with non-negligible residuals.

The residual SITEC ( $\delta$ ) has summer-winter hemispheric asymmetry (SWHA), consistently with that of O/N2 ratio [Tsugawa et al., JGR, 2006].

In this study,

the solar activity dependence of this SWHA is statistically analyzed using global GPS-TEC data and TIMED/GUVI column O/N2 ratio data.

We examine 104 SITEC events associated with flares larger than M5 class from 2000 through 2005 and compare  $\delta$  to O/N2 ratio.

The latitude gradient of  $\delta$  has a similar year-to-year variation, in addition to the annual variation, as that of O/N2.

The SWHA magnitude of both  $\delta$  and O/N2 decreases as the solar activity declines towards its minimum.

This strongly indicates SITEC depends not only on SZA but also on O/N2 ratio.

The SWHA of O/N2 is responsible for that of SITEC in both annual and year-to-year variations.