

# STORM TIME DEPRESSIONS AND/OR ENHANCEMENTS OF THE GPS-DERIVED TOTAL ELECTRON CONTENT IN CONJUGATE HEMISPHERES

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**Abstract.**

Global GPS-derived ionospheric maps, GIM, of the vertical total electron content, TEC, have been used for producing W index maps of the ionosphere-plasmasphere state. The degree of perturbation at each grid point of a map is pertained to W index of fixed level of TEC activity equal to 1 or -1 for the quiet state, 2 or -2 for the moderate disturbance, 3 or -3 for the moderate ionospheric storm, and 4 or -4 for intense ionospheric storm, with the sign + for TEC enhancement or - for TEC depletion. The storm time W index depressions (negative phase of the storm, -W) and enhancements (positive phase, +W) in the magnetic conjugate hemispheres are analysed in the present study for 147 planetary ionosphere-plasmasphere storms during 1999-2009 provided online at <http://www.izmiran.ru/services/iweather/storm/>. It is found that near 30% of +W and -W storm signatures occur either in the north end (W<sub>n</sub>) or south end (W<sub>s</sub>) of the magnetic line-of-force while TEC remains quiet or moderately disturbed at the opposite location in the conjugate hemisphere. Simultaneous positive phase of +W<sub>n</sub>&+W<sub>s</sub> is observed growing from 20% to 50% from solar maximum to solar minimum, while occurrence of both TEC depressions of W<sub>n</sub>&-W<sub>s</sub> is decreasing from 30% to 5% with decreasing solar activity. The opposite phases of the ionosphere-plasmasphere storm at the opposite ends of the line-of-force (+W<sub>s</sub>&-W<sub>n</sub>, or +W<sub>n</sub>&-W<sub>s</sub>) are observed less frequently varying from about 10% at solar maximum ceasing towards the solar minimum.