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Ionospheric Irregularity Influences On GPS Time Delay

Abstract:

All the trans-ionospheric signals interact with the ionosphere during their passage through ionosphere, hence are strongly influenced by the ionosphere. One of most important ionospheric effects on the trans-ionospheric signals is the delay both in range and time. Under this investigation we have studied the variability of ionospheric range delay in GPS signals. To accomplish this study we have used the GPS measurements at a low latitude station, IISC Bangalore (13.02N, 77.57E) during January 2012 to December 2012. We studied the diurnal monthly as well as seasonal variability of the range delay. We also selected five intense geomagnetic storms that occurred during 2012 and investigated the variability of delay during the disturbed conditions. From our study we found the diurnal variability of the range delay is similar to the diurnal pattern observed for TEC. The delay is maximum during the month of October while lowest delay is found to occur in the month of December. During summer season the range delay in GPS signals is less while the largest delay occurs during the equinox season. Both the delays follow a very good correlation with Dst index.