

The climatology of ionospheric irregularities observed by using GPS phase fluctuations in the east side of South America

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We examine ionospheric plasma irregularities observed by using several ground-based receivers of the global positioning system (GPS) located in the east side of South America during the period of 1995-2005 (a complete solar cycle). The primary statistic results show that the occurrence probability of GPS phase fluctuations, which caused by ionospheric irregularities, appears a broaden distribution pattern and peaks at local summer months (November-February) with high occurrence rate about 90%. In addition, the seasonal patterns of irregularity occurrences are similar for both high and low solar activities in local summer months, but in equinoctial months (March-April, September-October) the occurrence frequency of stronger GPS phase fluctuations increases obviously as solar activity increases. By contrast, in local winter months (May-August), GPS phase fluctuations rarely occur and they seem little solar activity dependence. The implications of the statistic results of GPS phase fluctuations will be discussed.