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Monitoring, mapping and prediction of ionospheric scintillation over the Brazilian equatorial and low latitude regions

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It is well known, today, that equatorial ionospheric scintillations affect performance of GPS receivers. Scintillation occurs when a radio wave crosses the ionosphere and suffers distortion in phase and amplitude. It also contributes to loss of lock of GPS receivers, resulting decrease of the number of available satellites and consequently yielding poor satellite geometry. Therefore, the required accuracy and positioning precision for aerial navigation are affected. Among other activities, EMBRACE, the space weather program of INPE, is monitoring and mapping the ionospheric scintillation over the South American equatorial and low latitude region in real time. This mapping is available in the internet by means of computer programs that retrieve data from a network of GPS receivers distributed in Brazil. These data are also being used to survey and predict the occurrence of ionospheric scintillation through data mining techniques.

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