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# Real Time Ionospheric TEC monitoring method applied to detect Solar Flares

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A method to monitor the ionospheric Total Electron Content (TEC) variations has been developed. It is based on using the dual-frequency GNSS receivers distributed world-wide and it supports running in post-process and in real-time as well. It is worth mentioning that the real time ionospheric TEC monitoring method can be supportd by NTRIP transport protocol GNSS streaming and requires a low computation load. This ionospheric sounding can be specially suitable to analyze ionospheric high frequency perturbations affecting local regions (TIDs and scintillations, among others) or wide regions (solar flares, solar eclipses, among others) with a high temporal and spatial resolution. In this context, a technique to detect the ionospheric TEC enhancement related to the X-ray/UV radiation of solar flares has also been implemented. This can be of great interest as solar flare particles can produce outstanding problems, such as interferences in communications, satellite damages or serious risks for astronauts, and as solar flare radiation can cause important GNSS signals disruptions, such as the ones occurred on 6th December, 2006. In this work, the main results have been obtained applying the ionospheric sounding method and the detection technique emulating real time in order to detect powerful X-class flares facing the Earth of the last years. The results are compatible with the Geostationary Operational Environmental Satellite (GOES) records and with the results from other authors. In fact, not only X-class flares are automatically detected but also some powerful M-class flares.