



## **Statistical study of the variation of ionospheric parameters observed by the satellite DEMETER during seismic activity**

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DEMETER is an ionospheric micro-satellite launched on a polar orbit at an altitude of 710 km. Its main scientific objective is to study the ionospheric perturbations in relation with seismic activity, and then, its scientific payload allows to measure electromagnetic waves and plasma parameters all around the Earth except in the auroral zones. Two specific parameters are taken into account in this paper: the electron density and the electrostatic turbulence. First the paper will show specific events where the electron density and the electrostatic turbulence are perturbed prior to large earthquakes above the future epicentre. Although, these examples have been carefully selected (close in time and space to the earthquakes, abnormal variations relative to the background level for the same location, the same local time and the same magnetic activity) it is always possible that the perturbations are due to other natural mechanisms because the ionosphere is highly variable and mainly under the control of the sun. Only a statistical analysis of the data is able to remove this ambiguity. As there are now more than two years of data, a statistical study has been set about the variation of these parameters during the seismic activity. The statistic is done as functions of the geographic position, the local time, and the magnetic activity. Geographical maps with average data are obtained to be used as background levels, and the superposed epoch method is applied to merge the data recorded during seismic activity. Comparison is done when we remove the aftershocks from the statistics.