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Statistical study of plasma density and temperature variations applied to the Great Sichuan Earthquake

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We report initial results from a detailed statistical study of the ion density and temperature variations and electrostatic turbulence occurrence observed by the DEMETER satellite over the Sichuan region during a period of 20 days encompassing the large earthquake of magnitude M=7.9 that occurred on May 12, 2008. This work was performed using an improved statistical method to analyze the whole set of data that was developed to help detecting possible earthquake precursors among larger irregular disturbances arising from the natural variability of the ionosphere. This method makes use of "reference zones" displaced respectively eastward and westward from the "epicentre zone" in order to recognize ionospheric variations that mainly result from magnetospheric activity and are present over a wider range of longitudes while plasma disturbances possibly induced by earthquakes in preparation maximize close to the "epicentre" zone. We have also used recently produced sector magnetic activity indices which allow to infer the longitudinal dependence of the magnetospheric processes. The initial outcomes of this study on plasma disturbances will be presented in the poster and compared with the previous conclusions inferred from a study of the electrostatic turbulence alone.