DEMETER results related to the seismic activity

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DEMETER was a 3-axis stabilized Earth-pointing spacecraft launched on June 29, 2004 into a low altitude (~ 710 km) polar and circular orbit that was subsequently lowered to 650 km till the end of the mission in December 2010. The orbit was nearly sun-synchronous with an ascending node at ~ 22.30 LT in the night sector and a descending node at ~ 10.30 LT during day-time. DEMETER measured electromagnetic waves and plasma parameters all around the Earth except in the auroral zones (invariant latitude > 65°).

This paper will present a review on the DEMETER observations related to the seismic activity. Up to now 104 papers have been published. They are referenced on http://smsc.cnes.fr/DEMETER/Fr/A_publications.htm. As the ionosphere is highly variable, Results of various statistical analyses will be presented. The statistical analyses are performed on the plasma parameters during night time. On one hand, it concerns the studies of the electric field and of the electron density. On the other hand, an algorithm has been implemented to detect crests and troughs in the ion density data before earthquakes. The earthquakes have been classified depending on their magnitude, depth, and location (land, below the sea). Special emphasis will be also given to Wenchuan (12 May 2008) and Chile (27 February 2010) earthquakes. The presentation will show a more detailed analysis of the ionosphere at the time of the Chili earthquake. The Chile earthquake is the second largest event since the launch of the satellite and a discussion about the possibility to use the satellite data to approximately predict the epicenter will be done.