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Possible variations of altitude observed on the occasion of the Tohoku earthquake (M=9.0) occurred on March 11, 2011

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Since 2009 a network of VLF (20-60 kHz) and LF (150-300 kHz) radio receivers was put into operation in Europe in order to study the disturbances produced by the earthquakes on the propagation of these signals. In 2011 the network was formed by nine receivers located three in Italy and one in Austria, Greece, Portugal, Romania, Russia, Turkey. Disturbances in the radio signals were observed after the occurrence of the Tohoku earthquake. These disturbances appeared clearly in some site and for some frequency. These disturbances cannot be connected directly with the processes occurred in the epicentral zone of the earthquake but they indicate the spreading of the disturbances produced in the atmosphere/ionosphere of the previous zone. On the contrary the Pacific radio network revealed disturbances 5-10 days before the occurrence of the earthquake and these disturbances are connected directly with processes occurred in the epicentral area. Since October 2010 a GPS receiver is into operation at Tokai (Japan) in an experiment on Neutrino Physics (T2K). The distance between the GPS receiver and the epicenter of the earthquake is about 350 km. The data collected by the receiver show an evident decrease in the altitude from the beginning of March 2011. This variation could be one of the mentioned processes. In order to confirm the effect we have analyzed the GPS data of the GSI (Geospatial Information Authority of Japan) network in the period January-April 2011. The results of this analysis are here presented.