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Investigation of seismo-ionospheric effects associated with Elazig and Van earthquakes in Turkey

I. Shagimuratov, Iu. Cherniak, I. Zakharenkova, N. Tepenitsyna, and G. Yakimova
WD IZMIRAN, Kaliningrad, Russian Federation (shagimuratov@mail.ru)

This report presents the specific features of TEC (total electron content of the ionosphere) behavior associated with earthquakes 08 March 2010 (Elazıg, Mw 6.1) and devastating earthquake with M 7.3, occurred on 23 October 2011 in Van. For this purpose we used both the GPS TEC data from the nearest to the epicenter GPS-IGS stations and constructed TEC maps over Europe. The favorable circumstance for this analysis was the quiet geomagnetic situation during the period previous to the earthquakes (the sum of Kp didn't exceed 5 for first and less than 15 for second case).
The typical anomaly was found out one week prior to Elazıg earthquake and three days prior to Van earthquake as the day-time significant increase of TEC at the nearest stations up to the value of 50% relative to the background condition. To estimate the spatial dimensions of seismo-ionospheric anomaly the differential mapping method was used. Anomalous TEC enhancement was registered since 10 UT and reached the maximal value of 45-55% at 18-20 UT. So, the seismo-ionospheric anomaly was found out as the cloud-shaped increase of total electron content of the ionosphere, it had a well-defined local character and it was situated in the immediate vicinity of the earthquake epicenter area.

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