Natural Hazards
and Earth System
Sciences

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Discussions

Interactive comment on "Review of variations in $M_w < 7$ earthquake motions on position and tec ($M_w = 6.5$ aegean sea earthquake sample)" *by* O. Yildirim et al.

Anonymous Referee #3

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To investigate the possible ionospheric precursories, we need major earthquakes and sufficient observation infrastructure to capture those event. Unfortunately, cases where both are available are rare. For moderate-size earthquakes, the monitoring real-time geodetic network should also be close enough to the area. Many large earthquakes in Turkey were missed due to the lack of a real-time GNSS network. Aside from the significance of the results presented in the text, The paper shows the one of the earliest examples of ionospheric monitoring via GNSS network in Turkey for Aegean earthquake Mw6.5. In this respect, the motivation is sound. However, there are several points that should be improved. First of all, the English of the paper is not satisfactory. Please, revise the English of the paper. I attach the Abstract that I revised for English

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Interactive Discussion

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to give an idea of required English editing. Second point is the differences between GIM and local TEC values. The differences between GIM and local TEC values are larger than the formal uncertainty of the TEC estimates. The authors could give some explanation about such discrepancy. Such as the number and distribution of IGS sites in Turkey which are used in the computation of GIM model etc.

Minor points:

Introduction: Add some references for the tectonic setting of the region of interest 5929: "four numbers of CORS-TR stations" should be "four CORS-TR stations" 5929: "positional resolution" should be "spatial resolution", "timewise resolution" should be "temporal resolution" 5929: Tylor should be "Taylor" 5930 and elsewere: Don't use continuous tense for understand. "it is being understood" should "it is understood" 5925: "A great many earthquakes occurred in the past in Turkey"

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 5923, 2015.

Turkey is a country located in the Middle Latitude zone where and in which tectonic activity is intensive. Lastly, an earthquake of magnitude 6.5Mw occurred at Aegean Sea offshore on date 24 May 2014 at 12:25 UTC which and it lasted about approximately 40 s. The said earthquake 5 was also felt also in Greece, Romania and Bulgaria in addition to Western Turkey. In the recent years, seismic origin ionospheric anomaly detection studies due to seismicity have been carried out done with TEC (Total Electron Contents) computed generated from GNSS (Global Navigation Satellite System) signal delays and several interesting the findings were published obtained have been revealed. In this study, both TEC and positional variations have been examined seperately following a moderate size regarding the earthquake which 10 occurred in the Aegean Sea. Then, tThe correlation of the said ionospheric variations with the positional variations was has been investigated. For this purpose, a total of fifteen stations have been used including among which the data of four numbers of CORS-TR stations in the seismic zone (AYVL, CANA, IPSA, YENC) besides and IGS and EUREF stations are used. The ionospheric and positional variations of AYVL, CANA, IPSA and YENC stations have 15 been examined by Bernese v5.0v software. When the obtained (PPP-TEC) values produced as result of the analysis are examined, it was observed that has been understood that in the the TEC values were approximately 4 TECU above the upper limit TEC value at four stations located in Turkey, three days before the earthquake at 08:00 and 10:00 UTC, the TEC values were approximately 4 TECU above the upper limit TEC value. At Still in the same stations again, on the one day before the earthquake at 06:00, 08:00 and 10:00 UTC, it is being 20 shown that the TEC values were approximately 5 TECU below the lower limit TEC value. On the other hand, the GIM-TEC values published by the CODE center have been examined. At Still in all stations, it was has been observed that three days before the earthquake, the TEC values in the time slices between portions of 08:00 and 10:00 UTC, were approximately 2 TECU above, one day before the earthquake at 06:00, 08:00 and 10:00 UTC, 25 the TEC values were approximately 4 TECU below the lower limit TEC value. Again, by using the same fifteen numbers of stations, positional variation investigation before and after the earthquake has been made for AYVL, CANA, IPSA and YENC stations. As a result of the analysis made, positional displacements has been seen be 5924 NHESSD 3, 5923–5956, 2015 Review of variations in Mw < 7 earthquake motions O. Yildirim et al. Title Page Abstract Introduction Conclusions References Tables Figures J I J I Back Close Full Screen / Esc Printer-friendly Version Interactive Discussion Discussion Paper | Discussion Paper | Discussion Paper | Discussion Paper | fore and after earthquake at CANA station which is the nearest station to earthquake center. It is about 10 and 3 cm before three days and one day earthquake.

Fig. 1.