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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "On a reported effect in ionospheric TEC around the time of the 6 April 2009 L'Aquila earthquake" *by* Fabrzio Masci et al.

Anonymous Referee #1

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I have strong reservation to this paper, because it is not a scientific paper but a kind of attack which purpose is not to clarify truth but to demolish the opponent. This publication is one from the series of other publications of the same authors (at least first two of them) which specialty is to prevent any publication where words "precursor" or "earthquake forecast" are used. Their knowledge have the encyclopedic character. They are experts in ULF electromagnetic signals, VLF propagation, particle precipitation, ionospheric physics, magnetometers, etc. They are kind of orderlies of science, cleaning it from unworthy scientists. From the list of their recent publications it is difficult to understand what is their own scientific specialty, what there own scientific research except the critics of others.

Coming to the discussed paper content we start from the determination of the vertical TEC they use: the integrated electron density in the vertical column above the

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GPS receiver given by Komjaty. But looking on results they give in the paper, we see that they use completely different TEC fro individual satellites with different elevation angle. Such kind of calculations give the TEC value not over the receiver but in sub-ionospheric point - the vertical projection on the ground surface of the point where the line between the satellite and receiver crosses ionosphere (usually at the altitude 400 km). This sub-ionospheric point never coincides with the receiver position until the elevation angle will be equal 90 degrees. Taking into account that satellite is moving, the sub-ionospheric point is also moving with time. The only software which uses the data no of one satellite but all satellites with elevation angle higher than set value (usually 45 degrees), and then by special procedure calculates the real vertical TEC over the receiver is the software of Luigi Ciraolo. And only this software gives adequate results for the ionospheric precursors studies.

The L'Aquila case was studied by many scholars and published in several papers and monographs. And all of them demonstrate the same result as Nenovsky: the positive anomaly on 5 of April over L'Aquila. The main identifier of the precursor is not the sign of deviation, not the magnitude of deviation, but its locality, connected with the impending epicenter position. To show that the observed anomaly has the local character, we calculated the differential map using the data of 32 Italian GPS receivers network presented in the Fig. 1. The map of Delta TEC fro the maximum deviation on 5 of April is shown in the attached Fig. 2. We see the clear positive anomaly exactly over the L'Aquila. As concerns the time series, our results coincides with result of Nenovski, we also see the positive anomaly few hours before the main shock. It is shown in the Fig. 3 calculated for L'Aquila receiver.

We can present more results for ionospheric anomalies over L'Aquila but it seems that's enough to demonstrate that Nenovski is right and the authors of this paper are wrong.

I'd like to underline the poor level of discussion. The main argument of the authors is to refer the publications of somebody without own calculations or arguments. For example, speaking on the physical mechanism of seismo-ionospheric coupling they

claim: many researchers are sceptical of the reliability of these mechanisms, and I can say with the same level of confidence that many researches support this mechanism. This is not the argument.

The poor quality of illustrations should also be mentioned, for example the Figure 4if to compare with our Figure 3.

Summarizing I would say that such type of publications are very dangerous: they create the new style of not science but fighting without strong arguments basing only on authority of somebodies publications. Concerning the results of the authors themselves, they look very poor and my conclusion is to reject this paper.

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Fig. 1. Map of Italian network of GPS receivers

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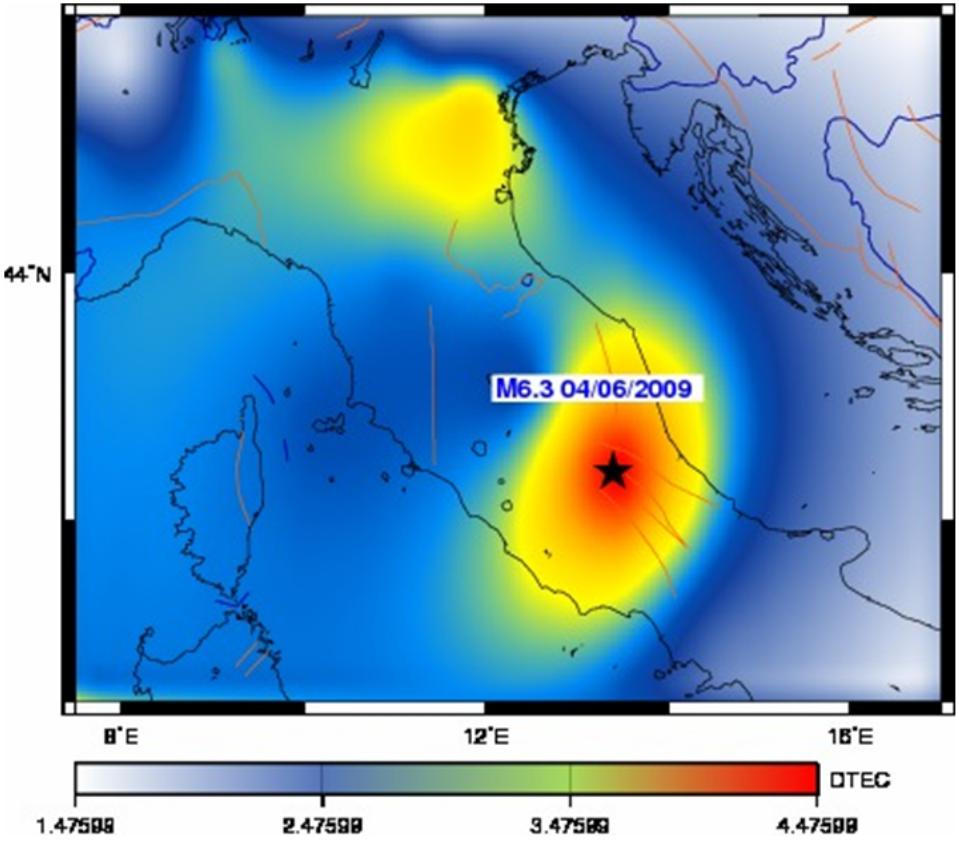

Fig. 2. Delta TEC map for 0400 UT on 5 April 2009

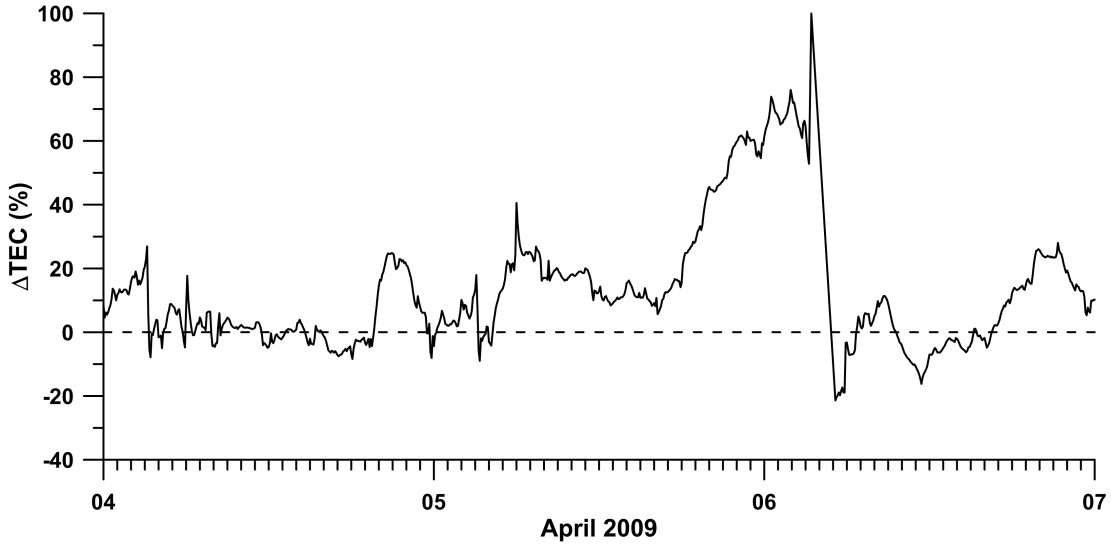

Fig. 3. Delta TEC, L'Aquila receiver

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