

# Comments on “Stochastic relation between anomalous propagation in the line-of-sight VHF radio band and occurrences of earthquakes” by K. Motojima and N. Haga

The paper of K. Motojima and N. Haga presents the interesting results of the research on the relation between anomalous line-of-sight propagation of electromagnetic waves and occurrences of earthquakes. Television and FM radio broadcasting waves of the VHF band are used and the received signal strength has been measured in the experiments. Application of the statistical data analysis gives rise the value of the obtained results.

Meanwhile the next specific comments has to be state.

In order to reduce the diurnal variation of a signal strength the authors divided a day into 72 time slots and performed a statistical analysis separately for each specific time slot, page 6833, line 24. Mean values ( $m$ ) and standard deviations ( $\sigma$ ) of observed data were separately calculated for each time slot through the observing period, page 6834, line 1. From these explanations, it is not quite clear how many mean values ( $m$ ) and standard deviations ( $\sigma$ ) will be obtained through the observing period completely. Reader can understand this only after thorough investigation the Figures 3, 5 and 6: there are only 72 mean values ( $m$ ) and 72 standard deviations ( $\sigma$ ) which are repeated every day for each temporal evolution on the Figures. This passage of the paper text needs for explanation that is more comprehensive.

The authors use the equation for unrelated probability  $P_{\text{unrel}}(t_{\text{per}})$  estimation without any basis comments or references on its validity, page 6835, line 11. It is important because the using the other equations for statistic of two unrelated occurrences: anomalous propagations (1) and earthquakes (2) would bring to the probability  $P_{\text{unrel}}$  dependence not only on the defined length of time  $t_{\text{per}}$ , page 6835, line 16, but on the number of occurrences  $N_{\text{anom}}$  and number of earthquakes  $N_{\text{eq}}$  too. The results of calculations may differ from the obtained in the paper.

The author should comment or show any data on the weather observation during occurrences of anomalous VHF radio wave propagation. Was there connection between the recorded anomalies and the atmospheric phenomena? It is necessary to give the exact number of earthquakes that happened before and after anomalous VHF propagation occurrences, (“before” is included to running paper title).

The manuscript requires some technical corrections.

The authors have to explain or present more correct data imaging on the Figures (Fig. 3, 5 and 6): 72 mean values ( $m$ ) and 72 standard deviations ( $\sigma$ ) in every day yield 20 minutes digitization. Why more detail temporal evolutions are shown on the Figures.

The presented review on the electromagnetic phenomena associated with seismicity (1 Introduction) would be more valuable if earlier investigations in this field were mentioned, for example:

Sobolev, G. A. and Hussamiddinov, S. S.: Pulsed electromagnetic Earth ionosphere field disturbances accompanying strong earthquakes, Jap. Earthquake Predict. Res., No3, pp.1-13, 1984;

Gokhberg, M. B., Morgounow, V. A., Yoshino, T., and Tomizawa, I.: Experimental measurements of electromagnetic emissions possibly related to earthquakes in Japan, J. Geophys. Res., v.87, No9, pp.7824-7888, 1982.

The References (page 6839, line 4-21) require checking and correction in author's names and journal title.

Some English expressions are wrong or unclear: panel are, page 6834, line 14; period associated anomalous propagation with, page 6835, line 12; probability shows comparable to, page 6835, line 24, etc.

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