



Up-to-dating of genetic codes of seismo-electromagnetic data related to the prediction of the earthquakes at North Anatolian Fault with cavity model: natural regularizations and seismo-electromagnetical resonance effects on the future Marmara Sea earthquakes

T. Sengor

Department of Electronics and Communication Engineering, Technical University of Yildiz, Istanbul, Turkey, sengor@yildiz.edu.tr / Fax:+90 212-2594967 Phone: +90 212-2597070

1 Abstract

The electromagnetic radiation mechanisms guiding the seismic activity in closed regions are modelled as suitable network of cavities and waveguides connected with natural boundary layers, physically [1]-[6]. The non-smooth, non-uniform, and sharp changes of electric charges have stochastic influences on seismic activity. The spatial and temporal characteristics of these influences create the equivalent seismo-electromagnetic source of the activity. These equivalent seismo-electromagnetic sources threshold a suitable mechanism, which trigger the earthquake zones.

The geological structures; i.e., faults, cracks, material differences, etc. work as circuit components fed with above said electromagnetic activity. These circuit components are modelled with the use of cavity, waveguide, and antenna structures [3], [6]. These structures create an interconnected electromagnetic network, when a specific closure is definable for a region involving possible seismic activities. The specific closure may involve either dependent zones or independent zones. The relationships between threshold-triggering mechanisms and electromagnetic radiation give the possibilities of transferring the seismic activity among non-connected zones, if some specific conditions are satisfied. These transfer mechanisms may work among different zones by

the creation of suitable boundary layers even if the zones are not related. The induced electric currents on the boundary layers generate these transfer mechanisms. The detailed analyses give some seismo-electromagnetical resonance effects.

The above said trends give very clear explanations for the irregularities and non-uniformities occurring in some phenomena of electromagnetic spectrum before, during, and after the earthquake phenomena.

The Marmara Sea is very suitable considering like a cavity with suitable closure involving several components working as above said interconnected electromagnetic network.

The data [2], [4] collected from 1999 to December 2006 related with Marmara Sea seismic region according to the above mentioned electromagnetically equivalent modelling of earthquake mechanism [1]-[2] are processed with the approach of genetic algorithms by using the earthquake prediction genetics [5]. The time domain variations of the cavity resonance processes fit to the previously observed data and provide natural regularizations on the future Marmara Sea earthquakes. The results observed from the method presented in this paper fit with the facts related on the periodical non-linearity explained in [7], too.

2 References

[1] T. Sengor, "The mechanism of interactions of irregularly oscillating bodies by electromagnetic waves," paper in *Electromagnetic Phenomena Related to Earthquake Prediction*, Hayakawa and Fujinawa (Eds.), pp. 647-666, TERRAPUB: Tokyo, 1994.

[2] T. Sengor, "On the exact interaction mechanism of electromagnetically generated phenomena with significant earthquakes and the observations related the exact predictions before the significant earthquakes at July 1999-May 2000 period, " *Helsinki Univ. Tech. Electrom. Lab. Rept.* 368, May 2001.

[3] T. Sengor, "Full wave analysis of earthquake sequences with waveguide and cavity effects: application in Aegean Sea – Izmir earthquakes of 2005 related to the coupling of great earthquakes of 2004," *European Geosciences Union Geophysical Research Abstracts*, Vol. 8, 00752, SRef-ID: 1607-7962/gra/EGU06-A-00752, ISSN: 1029-7006, European Geosciences Union General Assembly 2006, Vienna, Austria, 02-07 Nisan 2006.

[4] T. Sengor, "The Observational Findings Before The Great Earthquakes Of December 2004 And The Mechanism Extraction From Associated Electromagnetic Phenom-

ena," Book of XXVIIIth URSI GA 2005, pp. 191, EGH.9 (01443) and Proceedings 2005 CD, New Delhi, India, Oct. 23-29, 2005.

[5] T. Sengor, "The interaction mechanism among electromagnetic phenomena and geophysical-seismic-ionospheric phenomena with extraction for exact earthquake prediction genetics," 10th SA of the IAGA 2005, Abst. CD, GAI, C109, No.: IAGA2005-A-0134, Toulouse, France, July18-29, 2005.

[6] T. Sengor, "The electromagnetic radiation mechanism in faults: aperture antenna array in fractal structure," European Geosciences Union Geophysical Research Abstracts, Vol. 8, 00945, SRef-ID:1607-7962/gra/EGU06-A-00945, ISSN: 1029-7006, European Geosciences Union General Assembly 2006, Vienna, Austria, 02-07 Nisan 2006.

[7] T. Sengor, "The genes and seismicity genetics of the NAF: conflicts of historical earthquake theses," European Geosciences Union Geophysical Research Abstracts, Vol. 8, 00951, SRef-ID:1607-7962/gra/EGU06-A-00951, ISSN: 1029-7006, European Geosciences Union General Assembly 2006, Vienna, Austria, 02-07 Nisan 2006.