5th Asian Seismological Commission General Assembly 2004

Symposium on Seismic Hazard Evaluation and Risk Reduction

October 18-21, 2004
Yerevan, Armenia

Dedicated to the 15th Anniversary of the Devastating Armenian (Spitak) Earthquake

Second Circular

Organizers:

Asian Seismological Commission (ASC), IASPEI

Armenian Association of Seismology and Physics of the Earth (AASPE)

October 19

Lecture room: Tigran the Great, Ball Room/S3
Chairpersons: Abdullabekov Kharbay (Uzbekistan), Cao D. Trieu (Vietnam)
Conveners: Reilinger Robert, Rogozhin Eugene
Time duration: 13:00-17:00

13:00-13:20 **Invited Lecture:** Balassanian, S., **Gaal G.**, Leveinen, J. and Vironmäki J. (Sweden)
Application of Airborne Geophysics in Seismic Hazard Assessment

13:20-13:40 **Invited Lecture: Papadopoulos T. D.**, Alexopoulos J. and Voulgaris (Greece)
New Evidence for the Seismotectonic Environment of CW Attica, Greece

13:40-14:00 **Invited Lecture:** Hirahara K. (Japan)
Geofem Earthquake Cycle Simulation Using the Earth Simulator

14:05-14:25 Tariq Mahmood, Zahid Ali and **Muhammad Qaisar** (Pakistan)
Neotectonics of Sulaiman ARC Shared Zone, Pakistan

14:25-14:45 Nazaretyan S. (Armenia)
The Features of Intraplate Faulting Junctions' Seismicity and Their Role in Seismic Zonation

14:45-15:05 Sadykov D. Sh. (Kazahstan)
Model of Deformation in Layers of the Earth and Forecasts of Earthquakes

15:05-15:20 Coffee break

Chairpersons: Muhammad Qaisar (Pakistan), Sadykov Dusen (Kazahstan)

15:20-15:40 **Radulov A.**, Yaneva M. (Bulgaria)
New Data for Surface Rupture of the Chirpan Earthquake on April 14, 1928 (Bulgaria)

15:40-16:00 **Jafarizadeh M. R.**, Gheitanchi M. R. (Iran)
An Investigation on Seismicity of South Zagros and Variation for Extent of Folded Axes and the Region Special Tectonic

16:00-16:20 **Alekseev V.**, Dokukin V.and Ruzhin Yu. (Russia)
Fault Structure and Seismic Activity in a Region Along the Red Sea and the Dead Sea on the Data of the Measurements of Radon Degassing, Atmospheric Cloudiness, and Ionosphere Parameters

16:20-16:40 **Malaimani E.C.**, Ravikumar N., Padhy S., Srinivas G.S., Akilan A.and Chaitanya T. (India)
Deformation Processes by Estimation of Strain Field Using GPS-Gedesy in the Southern Indian Peninsula between India and Antarctica

16:40-17:00 **Dorostian A.**, Gheitanchi M. R. (Iran)
Seismiotectonics of Afghanistan and its Bordering Regions

NEW EVIDENCE FOR THE SEISMOTECTONIC ENVIRONMENT OF CW ATTICA, GREECE

PAPADOPOULOS T.D.[1], Alexopoulos J.[2] and Voulgaris N.[3]

Deep seismic and gravity measurements were conducted along profiles in CW Attica to investigate the subsurface structure of the area that suffered heavy damages after the Mw=5.9 of September, 7th 1999 earthquake. Within the framework of this investigation the following tasks were accomplished: a) Three long seismic lines of about 10km each, two of which in the epicentral area of Thriassion plain (west part of Athens) and one along the Parnitha Mtn-Penteli Mtn axis (central part of Athens) and b) eight gravity profiles, comprising 338 gravity measurements, four of which in the Thriassion plain, three in the meizoseismal area of Petroupoli, Aharnes and Thrakomacedones (east of Parnitha Mtn) and one along the Parnitha Mtn-Penteli Mtn axis.

Our initial intention was to explore the upper crust structure in an effort to better define the fault zones revealed by sparse geological and borehole data. According to these data, block type tectonism appears in both areas of Thriassion plain and in the heavily damaged area east of Parnitha Mtn, crossed by larger fault zones like Thriassion and Kamatero, Menidi and Thrakomacedones, respectively.

The main event was located at 23^0 33.9$^{'}$E and 38^0 06.3'N, in Thriassion plain while the focal depth was estimated to be 8km. The spatial distribution of the aftershock sequence displays a WNW-ESE trend and focal depth distribution around 6-7 km with rare appearance of events at shallow depths (<3km). The seismotectonic environment appears to be very complicated in the Thriassion area as the fault plane solutions of aftershocks revealed (N.Voulgaris et.al. 2001).

In this paper an integrated approach is presented to combine seismological, geophysical and geological-tectonic data in an effort to better define the seismotectonic environment in the areas of Thriassion plain and east of Parnitha Mtn region. According to the results obtained so far significant variation in the elevation of the alpine basement has been detected, resulting to relative low and high areas that are well correlated with fault zones. This elevation variation is greater and very characteristic in areas located close to mapped fault zones such as in Thriassion, Parnitha, Fili, Menidi fault zones, or in areas covered by Quaternary deposits where existing faults are buried (i.e. in Thrakomacedones).

In Thriassion plain the thickness of post-alpine sediments is relatively small (<300m). The Thriassion fault of NW-SE direction was detected along the three gravity profiles crossing it. Smaller faults were also detected along the gravity profiles, complicating further the structure of the area. As revealed by both gravity and seismic methods, along the Parnitha Mtn-Penteli Mtn axis a spectacular structure was detected NE of Thrakomacedones with the post-alpine sediments reaching a thickness of more than 1000m. This evidence is of particular importance in order to understand the geological and tectonic structure of Kifissos fault zone with a NE-SW trend which probably delineates the boundary between the non-metamorphic (westward) and metamorphic rocks (eastward). Additionally, along the gravity profiles more anomalies were detected showing the existence of smaller faults in this area that are worthy for further exploration in the future.

Session 3

Keywords: Seismotectonic, gravity anomaly, deep seismic investigation

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