

## NEWS AND NOTES

### 14<sup>th</sup> International Conference on Ground Penetrating Radar, 2012 – Parul Joshi, M. S. University of Baroda, Vadodara (*Email: parul\_geology@rediffmail.com*)

The 14<sup>th</sup> International conference on Ground Penetrating Radar was held in the Tongji University, Shanghai, China from 4-8 June, 2012. The conference was organized by the Department of Geotechnical Engineering and the School of Ocean & Earth Sciences of Tongji University under the financial support by the National Natural Science Foundation of China and Science and Technology Committee of Shanghai. The aims of the conference were to share technical knowledge and experience in GPR research, discuss future directions for GPR application and development and to exhibit latest development and advancement in GPR equipment. The conference was inaugurated by Prof. Xiongyao Xie (Chair) followed by the speech of Dr. Raffaele Persico (Member, GPR International Advisory Committee). The conference was attended by 235 delegates from 27 countries which included students also. Total of 137 oral and 54 poster presentations were made. A separate session for exhibitors was arranged in which 17 international and national companies participated and showcased the GPR of new era.

The oral presentations were held in the 12 sessions. In Session 1, 'Novel GPR System and Antennas' focused on the significant developments in GPR system, GPR survey methodology, development of radar antenna, development of handheld GPR and robot mounted GPR. Session 2 was on the use of radar waves in planetary exploration and was entitled, 'SAR and Planetary exploration'. The session 3, 'GPR Wave Interaction with the Earth', was focused on the use of the GPR for soil permittivity evaluation and propagation characteristics of EM waves in fractured media. In Session 4 entitled, 'Data Processing and Interpretation', significant improvements in the GPR data processing methods, GPR identification of voids inside concrete and accurate thickness estimation of backfill grouting layer behind shield were

highlighted. Session 5 focused on 'GPR application in the various fields of Sedimentology and Hydrology', many issues like the use of GPR in the estimation of soil water content, characterization of stratigraphy, estimation of density of ice, study of volcanic surge deposits and aeolian dunes and others were discussed. Session 6 was on the application of GPR in the field of Archaeology entitled, 'Archaeology-Diagnosis of historical buildings' and described the use of GPR in diagnosis of historical and cultural objects. Session 7 on 'Numerical Modeling', illustrated qualitative model of spatio-temporal radiation pattern of GPR antenna, numerical simulation and analysis for airborne GPR. Session 8 on 'Geology/Geotechnical Engineering, Utilities Detection and Mapping', exploring the GPR application in the Geology and the Geotechnical Engineering. Session 9 entitled, 'Inverse Problems', was focused on the multi-parameter spectral inversion for GPR signals of subsurface layered media and full waveform inversion of GPR data in frequency domain. Session 10 on 'Evaluation of Mining, Tunneling, Concrete and Pavements', focused on new developments in the use of GPR in mining and tunneling. Session 11 on 'Borehole Radar' included presentations delivering the information on the borehole radar prototypes, analysis of a direct wave in directional borehole radar, electromagnetic wave transmission characteristics research of single-borehole radar, etc. Session 12 titled, 'Demining, UXO & Human vital sign', describing the performance of a demining GPR related to soil properties and clutter, 3D segmentation of GPR data for landmine detection and application of the stepped-frequency continuous wave radar technique for detection of human cardio-respiratory signals. The following four keynote lectures were presented:

1. *Prof. Yaqiu Jin (Fudan University, China):* Simulation of radar sounder

echoes and inversion for Mars layered media.

2. *Dr. Steven Acrone (US Army Engineering and research center, USA):* GPR profiles of partially to completely unstratified geological formations.
3. *Prof. John Bradford (Center for Geophysical Investigation of the Shallow Subsurface, Department of Geosciences Boise State University):* The search for the lost graves of the Chinese miners in Hailey, Idaho, USA.
4. *Prof. Motoyuki Sato (Tohoku University, Japan):* GPR for disaster mitigation and beyond.

From India, five participants attended the conference. The presentations focused on the GPR application in the field of active tectonics, civil engineering and disaster management. Prof. G. Venkatachalan (Emeritus Fellow, IIT Bombay) co-convoked the session on "Geology/Geotechnical Engineering, Utilities Detection and Mapping" and also made a presentation on behalf of N. Munniappan (IIT Bombay) representing the results of radius estimation of buried cylindrical objects using GPR. Parul Joshi (M.S. University of Baroda) delivered presentation highlighting the significant results of GPR mapping along the active faults in the seismically active Kachchh basin. S. Sravanthi (IIT Kanpur) presented results of GPR investigation of buried subsurface structures at Alchhatra. Almelu V. Hebsur (IIT Bombay) presented a poster showing GPR response through FDTD simulation and response surface method. Dr. N. Ramanujan (Pondicherry University) presented a poster on application of GPR to detect orientation of cavities and caverns developed due to tectonic implication in Baratang Island, Middle Andaman.

The conference brought together scientists working on various aspects of GPR on a single platform to interact on issues relating to the use of GPR in geology and to update the existing knowledge.