Geophysics 2006: Conference on Applied Geophysics

By

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The 2006 FHWA-sponsored Highway Geophysics–NDE conference was held in the city of St. Louis, Missouri, December 4-7, 2007. The conference was well-attended and the papers and exhibits were well-received. The next conference will be held in Charlotte, NC in November 2008. (http://www.ncdot.org/doh/PRECONSTRUCT/highway/geotech/geophysicsconference/)
Overview:

The 2006 FHWA-sponsored Highway Geophysics–NDE conference was held in the city of St. Louis, Missouri, December 4-7, 2007. The conference was well-attended and the papers and exhibits were well-received. The next conference will be held in Charlotte, NC in November 2008. (http://www.ncdot.org/doh/PRECONSTRUCT/highway/geotech/geophysicsconference/)

A list of papers (by session) is appended. The complete proceedings can be viewed at http://www.umr.edu/2006geophysics/.

2006 Conference Proceedings (List of Paper by Session):

Session I

   General Geophysical-NDE Methodologies I
   Moderator: Thomas Fennessey

   Considering Geophysical Methods in the Geotechnical Subsurface Exploration Process: A Geotechnical Perspective
   Benjamin S. Rivers and Scott Anderson

   Military Applications of Geophysics
   Niklas H. Putnam

Session II

   General Geophysical-NDE Methodologies II
   Moderator: Mike Fritz

   How Transportation Agencies Use Geophysics
   Phil Sirles and Khamis Y. Haramy

   Selection of Appropriate Geophysical Techniques: A Generalized Protocol Based on Engineering Objectives and Site Characteristics
   Neil L. Anderson

   QA/QC and Geophysical Projects
   Rick Hoover
Session III-A

Abandoned Underground Mines
Moderator: Tom Lefchik

Differentiating Rooms and Pillars on Reflection Seismic Profiles: A Seismic Investigation of Two Abandoned Coal Mines
Neil L. Anderson, Derek B. Apel, Ahmed Ismail, Oleg Kovin and Vanja Dezelic

Imaging Mine Voids Using Continuous Vertical Electrical Sounding Methods
Peter J. Hutchinson

Geophysical Technologies to Image Old Mine Works
Kanaan Hanna, Bart Hoekstra, Jim Pfeiffer and Brandy Uphouse

Mine Delineation Using Geophysics — Kansas Department of Transportation — Past, Present and Future
Bob Henthorne

2D MASW Abandoned Mine Detection
Edward D. Billington

Session III-B

Determination of Engineering Properties
Moderator: Sami Eyuboglu

Use of Refraction Microtremor (ReMi) Data for Shear Wave Velocity Determination at an Urban Bridge Rehabilitation Site
Douglas W. Lambert, Glenn Adams and Veronica Hawley

Beyond Rippability — A Case History Integrating Seismic Refraction, Electrical Resistivity Imaging, and Geotechnical Boring Logs
Jonathon B. Shawver, William Dalrymple and Robert Orr

Geotechnical and Geophysical Case Studies Involving the Refraction Microtremor (ReMi) Method for Shear Wave Profiling
Satish Pullammanappallil

Geophysical Mapping of the Vertical Extent of Soft Sediments in Former Lime Settlement Ponds
Mark J. Howell

Shear Wave Soil Velocities Over Failing Culverts Using the Refraction Microtremor ReMi™ Technique
Priscilla Duskin and Satish Pullammanappallil

Session IV-A

Determination of Lithology
Moderator: John Sexton/Ed Woolery
Application of Ground Penetrating Radar for Near Surface Geology
Haydar Al-Shukri, Hanan Mahdi and Okba Al Kadi

Integrated Geophysical Methods for Geotechnical Subsurface Investigations
Mark Fish and Krystle Day

Integrating Seismic Refraction and Surface Wave Data Collection and Interpretation for Geotechnical Site Characterization
Michael L. Rucker

Session IV-B

Pavements I
Moderator: Carl D. Rascoe

Design Moduli for Flexible Pavements Using Seismic Tests
Imad Abdallah, Soheil Nazarian and Deren Yuan

Integration of FWD and GPR
Robert Parrillo, Roger Roberts and Gary Sanati

Determining Concrete Thickness and Overlay Bond Quality of Roadways Using Ground-Penetrating Radar
Jeremy S. Strohmeyer, Edward D. Billington and Kenneth E. Derrenbacher

Benefits of Linking Digital Video and GPS to High-Speed Pavement GPR Data
Francisco A. Romero, Dimitri A. Grivas, Jonathan Shawver and John Makresias
(PRESENTATION ONLY)

Session V-A

Estimating Depth to Bedrock
Moderator: Neil Croxton

Examples of Subsurface Velocity Imaging Via Combined Downhole and Surface Source and Receiver Arrays
William P. Owen

Advancements in 3D Subsurface Modeling Using Seismic Refraction Data — A New Perspective
Phil Sirles, Alan Rock and Khamis Y. Haramy

Imaging Glacial Sediments and Underlying Bedrock in Illinois Using Surface Wave Data Acquired by a Land Streamer
Ahmed Ismail and Steve Sargent

Subsurface Geophysical Investigation Proposed Bridge Site for Breathitt Parkway Extension Over I-24 Christian County, Kentucky
D. Michael Gragg, Leigh Ann Croft, Bart Asher and Darrin Beckett
Session V-B

Pavements II
Moderator: Francisco Romero

Automated Processing of Ground Penetrating Radar Pavement Data
Kenneth R. Maser (PRESENTATION ONLY)

Transverse Contraction Joints Evaluation Using Ground Penetrating Radar
Cherif Amer-Yahia and Todd Majidzadeh

Step Frequency GPR Evaluation of the Natchez Trace Parkway: Pavement and Infrastructure Measurement and Assessment for FHWA Digital Highway Measurement Vehicle Applications
Michael Scott, Nicholas Gagarin, Milton K. Mills and Morton Oskard

A Brief Review on Different Surface Wave Methods and Their Applicability for Non-Destructive Evaluation of Pavements
Amit Goel and Animesh Das

Session VI-A

Bridge Foundations/Substructures
Moderator: Ned Billington/Khamis Y. Haramy

Ground Penetrating Radar Inspection to Evaluate Stability of Sound Wall Pillars
James Pfeiffer and Kanaan Hanna

Crosshole Sonic Logging: Insights on Testing Nevada Infrastructure
Gretchen C. Schmauder, Steve D. Bowman and Thomas J. Adams

Factors Affecting CSL Data Quality
Khamis Y. Haramy, Alan Rock and Nien Yin Chang

State of Practice of NDE Technologies in Bridge Inspection
Xinbao Yu and Xiong Yu

Session VI-B

Subsurface Voids/Karst
Moderator: Julian Ivanov

Combining Seismic Velocity Tomography and Single-Hole Reflector Tracing to Improve Volumetric Ground Imaging — Case Studies
Jozef M. Descour, Roger Surdahl, Yamamoto Takuji, and Shirasagi Suguru

Ground-Truthing Seismic Refraction Tomography for Sinkhole Detection in Florida
Dennis R. Hiltunen, Nick Hudyma, Timothy P. Quigley and Chandra Samakur
A Review and Evaluation of the Geological and Geophysical Surveys and General Cost Comparison: For the Investigation of Sinkholes on US-18 in Cerro Gordo County, Iowa
Matthew Trainum

Identification of Buried Sinkholes, Fractures and Soil Pipes Using Ground-Penetrating Radar and 2D Electrical Resistivity Tomography
Philip J. Carpenter and Dean W. Ekberg

Session VII-A

Mapping/Locating Utilities
Moderator: Doug Lambert

Common Bonding and Its Affect on Locating Underground Utilities
Jim Grimes
(PRESENTATION ONLY)

Computer Assisted Radar Tomography — A Tool in the Subsurface Utility Engineering Process
Kate McKinley

A GPR Sensitivity Analysis for Locating Various Utilities
Glen Adams, Veronica Hawley and Michael Roark

Session VII-B

Bridge Deck/Superstructure
Moderator: Ken Maser/Glenn Washer

Advances in Non-Contact Impact-Echo Scanning
Alex Gibson

Bridge Deck Condition Assessment Using GPR Comparison of 2 GHZ Horn and 1.5 GHZ Ground-Coupled Antennas
Robert Parrillo and Roger Roberts

Air-Coupled Impact-Echo Imaging of Concrete Decks and Slabs
John S. Popovics and Jinying Zhu

Session VIII-A

Groundwater
Moderator: Jon Robison

Determination of Groundwater Flow Direction in a Single Well by Electrical Conductivity Method
Nexhip Maska

Assessment of Karst Activity at Highway Construction Sites in Green and Jefferson Counties, Missouri, Using the Electrical Resistivity Method
Neil L. Anderson, Derek B. Apel, Vanja Dezelic, Ahmed Ismail and Oleg Kovic
Investigating Dam Seepage Using Electrical Resistivity Method
Moikwathai Moidaki, Neil L. Anderson and Estella A. Atekwana

Finite Difference Time Domain (FDTD) Modeling of Ground Penetrating Radar (GPR) for Heterogeneous Media by Using an Efficient Robust Algorithm
Sami Eyuboglu, Jeffrey J. Daniels and Kendra A. Pyke

Session VIII-B

Archaeology I
Moderator: Steve Dasovich

Geophysical Investigations for the Ruins Road Relocation Aztec Ruins National Monument, New Mexico
Donald W. Johnson and Ron Schirmer

Targeted Near-Surface Geophysical Survey as an Element of a Multi-Stage Research Design
R. Berle Clay

The Role of Geophysical Survey in Buried Archaeological Site Discovery and Evaluation
Staffan Peterson and G. William Monaghan

Ground-Truthing using the GeoScan Research FM36 Fluxgate Gradiometer: Ratz Site, 11Ms79
Steve Dasovich
(PRESENTATION ONLY)

Session IX-A

Miscellaneous Geophysical-NDE Methodologies
Moderator: Ed Woolery/Kanaan Hanna

Use of 3-D Ground-Penetrating Radar Data for Fractures Imaging
Oleg N. Kovin and Neil L. Anderson

Application of Continuous Alignment Geophysical Surveys for Florida Roadway Projects
Robert Werner and David Horhota

A 2-D MASW Shear-Wave Velocity Profile Along a Test Segment of Interstate I-70, St. Louis, Missouri
T. Thitimakorn and Neil L. Anderson

Session IX-B

Archaeology II
Moderator: Steve Dasovich

The Wyandotte County Cemetery: A Case Study in Geophysical Assessment of Historic Cemeteries
Geoffrey Jones
GPR Applied to Archaeological Investigations Supporting Transportation Projects
Robert M. Orr and Jonathan B. Shawver

Improving Excavation Accuracy and Reducing Cost Through the Use of Geophysical Applications for Archaeology
James Pomfret

Session X

Bridge Scour/Unknown Foundations
Moderator: Ahmed Ismail

Surface Geophysics as Tools for Characterizing Existing Bridge Foundation and Scour Conditions
Michael L. Rucker

Determination of Unknown Length of Sheet Piles Using Three Geophysical Logging Methods
Frank Jalinoos, Alex Gibson, John Diehl, Philip Hadfield and George Gordon

Unknown Bridge Foundation Investigations Using Wave Mechanics
J. Darren Holt
(PRESENTATION ONLY)

Session XI-A

Mapping with Electromagnetic Induction Geophysical Instruments
Mike Catalano

Session XI-B

Application of Geophysics in Karst Terrain
Lynn Yuhr

Session XI-C

The SeisOpt® ReMi V30+™ System
Satish Pullammanappallil

Session XII-A

OhmMapper TRN Capacitively-Coupled Resistivity Imaging System
Doug Groom

Session XII-B

Road Doctor Pavement GPR, Video and Data Integration/Analysis Software
Francisco A. Romero