

ENDE 2006
**The Eleventh International Workshop on Electromagnetic
Nondestructive Evaluation**

Hotel APPI Grand
Hachimantai-shi, Iwate, Japan
June 14th-16th, 2006

Workshop Program

Wednesday, June 14th, 2006

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| 12:00 | | Registration |
| 13:20 | | Introductory Remarks – Seiki Takahashi |
| 13:30-14:00 | | Invited Talk – “Inspection Experience of Steam Generator Tubes with Intelligent ECT Probe”
Masaaki Kurokawa |
| Session1: | | <i>ECT Modeling</i> |
| | | Co-chairs: D. Lesselier, A. Tamburrino |
| 14:00-14:20 | 14pA-01 | “EC Modeling by Coupled Circuits Method Considering the Skin and Proximity Effects”
V. Doirat, G. Berthiau, J. Fouladgar, A. Lefevre |
| 14:20-14:40 | 14pA-02 | “Eddy Current Modeling for Inspection of Riveted Structures in Aeronautic”
S. Paillard, G. Pichenot, M. Lambert, H. Voillaume |
| 14:40-15:00 | 14pA-03 | “Numerical Modeling of a Continuous Level Eddy Current Imager”
G. Rubinacci, A. Tamburrino, S. Ventre, P. Y. Joubert, J. Pinassaud |
| | | <i>Coffee Break</i> |
| Session2: | | <i>ECT Modeling and Simulation</i> |
| | | Co-chairs: G. Rubinacci, T. Takagi |
| 15:20-15:40 | 14pB-04 | “Developments in Modelling Eddy Current Coil Interactions with a Right-angled Conductive Wedge”
T. Theodoulidis, N. Poulakis, J. R. Bowler |
| 15:40-16:00 | 14pB-05 | “Volumetric and Surface Flaw Models for the Computation of the EC T/R Probe Signal Due to a Thin Opening Flaw”
L. Maurice, D. Prémel, J. Pàvò, D. Lesselier, A. Nicolas |
| 16:00-16:20 | 14pB-06 | Withdrawn |

- 16:20-16:40 14pB-07 **“A Novel Chua’s Circuit for Magnetic Anomalies Detection”**
A. Serri
- Coffee Break*
- Session3:** *Eddy Current Testing*
Co-chairs: J. Pàvò, T. Theodoulidis
- 17:00-17:20 14pC-08 **“Experimental Extraction of Time-of-Flight from Eddy Current Test Data”**
A. Tamburrino, N. Nair, S. Udpa, L. Udpa
- 17:20-17:40 14pC-09 **“A Probe Array for Fast Quantitative Eddy Current Imaging”**
C. Abbate, A. Tamburrino, S. Ventre, M. Morozov, G. Rubinacci
- 17:40-18:00 14pC-10 **“Novel Electromagnetic Method for Crack Evaluation”**
L. Janousek, N. Yusa, K. Miya
- 18:00-18:20 14pC-11 **“Proposal of Combined System of Electromagnetic Acoustic Transducer and Eddy Current Probe”**
T. Uchimoto, P. Guy, T. Takagi, K. Suzuki, T. Okuyama, T. Sato, A. Casse
- 19:00- *Dinner* **Room “Ryuugamori”**

Thursday, June 15th, 2006

- 9:00-9:30 **Invited Talk – “Origin, Measurement and Application of Barkhausen Effect in Steels”**
Anthony J. Moses, D. C. Jiles
- Session4:** *New Methods*
Co-chairs: K. Ara, S. Udpa
- 9:30-9:50 15aA-01 **“Evaluation of Fatigue Loaded Conducting Structures Using Selected Electromagnetic NDT Methods”**
T. Chady, R. Sikora, G. Psuj, M. Enokizono, Y. Tsuchida
- 9:50-10:10 15aA-02 **“Evaluation of Circumferential Crack Location in Pipes by Electromagnetic Waves”**
K. Abbasi, H. Hashizume, K. Yuki
- 10:10-10:30 15aA-03 **“Numerical Consideration of Magnetic Lens”**
J. Lee, T. Shoji
- Coffee Break*
- Session5:** *Industrial Applications*
Co-chairs: A. Serri, T. Uchimoto
- 10:45-11:05 15aB-04 **“Inspection of Cement Based Materials Using Microwaves”**
K. Arunachalam, V. R. Melapudi, L. Udpa and S. S. Udpa

- 11:05-11:25 15aB-05 **“Defect Profiling Using Multi-Frequency Eddy Current Data from Steam Generator Tubes”**
K. Arunachalam, O. Uduebho, S. A. Kumar, P. Ramuhalli, J. Benson, L. Udpa, S. S. Udpa
- 11:25-11:45 15aB-06 **“Electromagnetic Reading of Laser Scribed Logistic Markers on Metallic Components”**
S. Gyimóthy, A. Gasparics, Z. Kalincsák, J. Pávó, I. Sebestyén, G. Vértesy, J. Takács, H. Tsuboi
- 11:45-12:05 15aB-07 **“Design of a Remote Field Eddy Current Probe Dedicated for Inspection of a Magnetic Tube from Its Outer Surface”**
T. Marek, D. Gombarska, L. Janousek, K. Capova, N. Yusa, K. Miya

Lunch

Session6:

NDE by Magnetism I

Co-chairs: D. G. Park, G. Y. Tian

- 14:30-14:50 15pA-01 **“Evaluation of Austenitic Materials by Magneto-Optical Minor Hysteresis Loops”**
P. Novotný, P. Macháč, M. Kučera, K. Nitsch
- 14:50-15:10 15pA-02 **“Accurate Detection of Material Degradation of Stainless Steel by ECT Sensor”**
T. Teramoto
- 15:10-15:30 15pA-03 **“Micromagnetic Characterization of Thermal Degradation in Cu-rich Alloys and Results to Neutron-Irradiation”**
I. Altpeter, G. Dobmann, G. Hübschen, M. Kopp, M. Pirlog, K. Szielasko
- 15:30-15:50 15pA-04 **“Challenges in Quantifying Barkhausen Noise in Electrical Steels”**
A. J. Moses, H. V. Patel, P. I. Williams

Coffee Break

Session7:

NDE by Magnetism II

Co-chairs: P. Novotný, S. Takahashi,

- 16:05-16:25 15pB-05 **“Magnetic Adaptive Testing: Influence of Experimental Conditions”**
G. Vértesy, T. Uchimoto, T. Takagi, I. Tomáš
- 16:25-16:45 15pB-06 **“Magnetic Memory Method”**
L. Li, E. Yang, X. Chen
- 16:45-17:05 15pB-07 **“Magnetic-acoustic Emission for Stress and Material Characterisation”**
G. Y. Tian, J. Wilson, J. Kepřt
- 17:05-17:25 15pB-08 **“The Relation between Mechanical and Magnetic Property in the Thermal Annealed RPV Steel”**
D. G. Park, I. G. Park, G. D. Kim, W. W. Kim, J. H. Hong

Session8:***Poster***

- 17:30-19:00 PS-01 **“Visualization of Stress Distribution by Elasticoluminescent Material”**
Y. Imai, H. Yamada, N. Terasaki, Y. Adachi, K. Nishikubo, H. Zhang, L. Qian, L. Zhang, C. Li, C. N. Xu
- PS-02 **“Investigation of Sample Flux Penetration with Single-yoke Magnetizing Setup”**
O. Stupakov, H. Kikuchi, I. Tomáš, T. Liu, S. Takahashi
- PS-03 **“Creep-induced Microstructural Change in a Martensitic Stainless Steel”**
T. Ohtani, H. Ogi, M. Hirao
- PS-04 **“Automatic Discrimination of Stress Corrosion and Fatigue Cracks Using Eddy Current Testing”**
S. Perrin, N. Yusa, K. Miya
- PS-05 **“NDE Method Using Minor Hysteresis Loops in Ferromagnetic Materials”**
S. Takahashi, S. Kobayashi, Y. Kamada, H. Kikuchi, K. Ara
- PS-06 **“Numerical Analysis for Non-destructive Evaluation Taking Account into Measured Magnetic Properties Depending on Hardening Depth”**
Y. Kai, Y. Tsuchida, M. Enokizono
- PS-07 **“Numerical Simulations of Pipe with Metallic Coating”**
Y. Li, G. Y. Tian
- PS-08 **“Investigation of Neutron Radiation Effects on Fe Model Alloys by Minor-loop Analysis”**
S. Kobayashi, H. Kikuchi, S. Takahashi, K. Ara, Y. Kamada
- PS-09 **“A Model of Cup-Core Probes for Eddy Current NDE Using Eigenfunction Expansions”**
H. Bayani, T. Theodoulidis, I. Sasada
- PS-10 **“Effect of Thermal Aging on Magnetic Properties and Hardness in 2.25Cr-1Mo Steels”**
Y. Kamada, T. Hosoda, H. Kikuchi, S. Takahashi, T. Imai, T. Miyoshi, S. Ogiso
- PS-11 **“Conductivity Evaluation in Welded Joints by Eddy-Current Method”**
H. Tian, T. Uchimoto, T. Takagi, T. Nozaki
- PS-12 **“Development of Metal Detection System for Reuse of Dismantled Woods from Houses”**
T. Yasutake, T. Chady, Y. Tsuchida, M. Enokizono
- PS-13 **“Detection Probability Improvement Techniques for the Magnetic Camera”**
J. Lee, J. Hwang
- PS-14 **“Application of Thermoelectric Power Measurement to Nondestructive Testing Technique”**
S. Yamanaka, Y. Kawaguchi, T. Ohtani, K. Kurosaki
- PS-15 **“Neural Processing in ND Techniques for Corrosion Detection in Industrial Pipelines”**
A. Serri

PS-16 **“Evaluation of Magnetic Properties on Small Specimen for NDE”**
K. Chiba, H. Kikuchi, Y. Kamada, K. Ara, S. Kobayashi, S. Takahashi

19:30- **Dinner** Restaurant “Arlberg”

Friday, June 16th, 2006

9:00-9:30 **Invited Talk – “A New Initiative: Universal Network for Magnetic Non-destructive Evaluation”**
Gábor Vértesy

Session9: *Inverse Problem*

Co-chairs: Z. Chen, L. Janousek

9:30-9:50 16aA-01 **“Simulation of Layered Structures with Fixed Transmittance or Reflectance of Electromagnetic Waves”**
V. N. Emets, I. V. Bychkov, V. D. Buchelnikov, T. Takagi, T. Uchimoto

9:50-10:10 16aA-02 **“Nondestructive Evaluation for Material Degradation of Steel Sample Using Minor Hysteresis Loop Observations”**
F. Kojima, R. Nishiyama

10:10-10:30 16aA-03 Withdrawn

Coffee Break

Session10: *Inverse Problem and Benchmark*

Co-chairs: G. Berthiau, F. Kojima

10:45-11:05 16aB-04 **“Identification of Defects from ECT Signals Using Linear Discriminant Function”**
W. Cheng, S. Kanemoto, M. Shiwa, I. Komura

11:05-11:25 16aB-05 **“Sizing of SCC from ECT Signals with Consideration of Crack Width”**
Z. Chen, N. Yusa, K. Miya

11:25-11:45 16aB-06 **“Reconstruction Of Fatigue Cracks Using Benchmark Eddy Currents Signals”**
M. Morozov, G. Rubinacci, S. Ventre

11:45-12:05 16aB-07 **“2D Axisymmetric ECT Simulation of the World Federation's First Eddy Current Benchmark Problem”**
O. Mihalache, M. Ueda, T. Yamashita

Lunch

Oral Session: Session1 - 7, 9, 10 Room “Ryuugamori”
Poster Session: Session8 Room “Hanawa”