TABLE TOP PRESENTATION

Invitation

Deadline April 30, 2011

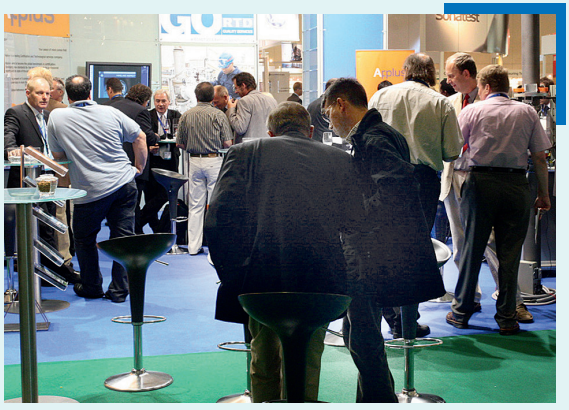
The symposium is devoted to promote a broad exchange of information, applications, operations and quality assurance in the area of digital industrial radiology as well as computed tomography.

The meeting provides a unique opportunity for users, scientists, equipment suppliers and all who are interested to discuss the present and future possibilities of new X-ray detectors and sources, image processing algorithms, volume scanning, geometrical feature extraction, local density distribution up to related methods like laminography and tomography with neutrons.

The fee for table top presentation is 800.00 Euro plus Value Added Tax (VAT). The fee includes:

- ⇨ 1 poster wall, 1 standard plug, one table, one chair
  (additional equipment available by request)
- ⇨ 1 conference badge with full conference participation
- ⇨ publication of logo and profile of your company on the conference web page and in the brochure of abstracts, which will be handed out to all participants

A registration form please find at www.dir2011.com.



DEUTSCHE GESELLSCHAFT FÜR ZERSTÖRUNGSFREIE PRÜFUNG E.V.

BAM

INVITATION AND PROGRAMME

International Symposium on

Digital Industrial Radiology and Computed Tomography

co-sponsored by

ASNT

cofrend

BINDT THE BRITISH INSTITUTE OF NON-DESTRUCTIVE TESTING

June 20 – 22, 2011, Berlin, Germany

Registration

until **June 14, 2011** please send to
German Society for Non-Destructive Testing (DGZfP e.V.)
Max-Planck-Str. 6 | 12489 Berlin, Germany
Phone: +49 30 67807-122/123 | Fax: +49 30 67807-129
E-mail: tagungen@dgzfp.de
www.dir2011.com

Fees

Registration fee	590.00 €
Presenting authors (only one person per paper)	530.00 €
Members of DGZfP, ASNT, BINDT, Cofrend	530.00 €
Students (without university degree)	200.00 €
Additional conference dinner	75.00 €

The registration fees include admission to all sessions, coffee breaks, lunch, proceedings on CD-ROM, social programme

Cancellation

by May 23, 2011 (receipt at DGZfP): 25,00 €
by June 15, 2011: 50 % of the participation fee
from June 16, 2011: no refund possible

Payment

The payment of the participation fees is requested only in EUR and has to be done after receipt of invoice by June 14, 2011 (receipt of payment).
All payments after this date have to be done by credit card (Visa or Mastercard) or cash at the registration desk.

Bank Transfer

DGZfP e.V., Berliner Volksbank, Kekuléstr. 2-4,
12489 Berlin, Germany
Acc. No. 5940 040 002, BLZ (code) 100 900 00
For international bank transfer please use our International Bank Account Number (IBAN)
DE 57 100 90 000 59 400 400 02
SWIFT Code (BIC): BEVODE BB
Please quote invoice no. and name of the participant.

Conference Secretariat

German Society for Non-Destructive Testing
(DGZfP e.V.)
Steffi Schäske
Max-Planck-Str. 6 | 12489 Berlin, Germany
Phone: +49 30 67807-120
Fax: +49 30 67807-129
E-mail: tagungen@dgzfp.de

Conference Venue

Seminaris CampusHotel Berlin
Takustrasse 39 | 14195 Berlin | Germany
www.seminaris.de/berlin

Language

All technical papers will be presented in English, simultaneous translation will not be provided.

Proceedings

The proceedings will be published on CD-ROM and will be available after the conference.
The manuscripts (in English) must be received by DGZfP as an electronic file by June 20, 2011.
Guidelines for preparing and submitting manuscripts are published on the conference website.

Hotel Reservation

We have special conditions in the conference hotel Seminaris. A hotel reservation form please find on the web page www.dir2011.com. Other hotels can be booked at www.berlin.de/tourismus

Social Programme

- Postershow and Exhibition: June 20, 2011, 17:30 h
- Conference evening by boat: June 21, 2011, 19:30 – 23:00 h, sightseeing trip along the Spree river through the historical and modern Berlin (Bustransfer from Seminaris CampusHotel 19:00 h)

Scientific Advisory Committee

Markus Bartscher, PTB, Braunschweig, Germany
Klaus Bavendiek, YXLON, Hamburg, Germany
Thomas Bonin, CEA/DAM, Bruyères-le-Châtel, France
Cliff Bueno, GE GRC, Niskayuna, USA
Steve Burch, ESR Technology, Abingdon, United Kingdom
Jürgen Goebbels, BAM, Berlin, Germany
Bernhard Illerhaus, BAM, Berlin, Germany
Valerie Kaftandjian, INSA-Lyon, Villeurbanne, France
Stefan Kasperl, Fraunhofer EZRT, Fürth, Germany
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Reinhold Oster, Eurocopter, München, Germany
Christoph Sauerwein, RayScan, Meersburg, Germany
Martin Simon, Wenzel Volumetrik, Singen, Germany
Jürgen Stephan, Siemens, München, Germany
Christian Thiery, CEA/DAM, Bruyères-le-Châtel, France
Uwe Zscherpel, BAM, Berlin, Germany

GENERAL INFORMATION

This international symposium is devoted to promote a broad exchange of information on technologies, applications, quality assurance and standards in the area of digital industrial radiology and computed tomography. The meeting provides a unique opportunity for users, scientists, equipment suppliers and all who are interested to discuss the present and future possibilities for industrial applications of the following topics:

- ⇨ X-ray Detectors and Sources
- ⇨ Radiography (Multi-Angle)
- ⇨ Computed Tomography
- ⇨ Laminography & Tomosynthesis
- ⇨ Dual and Multi-Energies
- ⇨ Phase Contrast
- ⇨ Image Processing Algorithms
- ⇨ Quantitative Imaging
- ⇨ Modelling
- ⇨ Data Fusion
- ⇨ Scattering
- ⇨ Defect Detection & Localisation
- ⇨ Feature Extraction
- ⇨ Dimensional Control
- ⇨ Standardisation
- ⇨ Qualification & System Reliability

The programme is complemented by a Table-Top Exhibition.

Background

BAM and the German Society for Non-Destructive Testing have organised a series of events on Industrial Computed Tomography and Image Processing together with other partners since 1988. The last symposium was held together with Cofrend 2007 in Lyon, France.

J. Goebbels
DGZfP Subcommittee
Computed Tomography,
BAM, Berlin, NDT, Micro NDE

U. Zscherpel
DGZfP Subcommittee
Digital Radiology,
BAM, Berlin, NDT, Radiology

09:00 OPENING

Mo.1
X-RAY SOURCES
Chair: E. Neuser

09:30 **Mo.1.1**

Reducing the Focal Spot Shift of Microfocus X-ray Tubes to Increase the Accuracy of CT-Based Dimensional Measurement
J.P. Steffen, T. Fröba, X-RAY WorX, Garbsen, Germany

10:00 **Mo.1.2**

Liquid Metal Jet Micro-Focus X-ray Source: Highest Brilliance for Home Lab Instrumentation
C. Ollinger, Bruker AXS, Karlsruhe, Germany

10:30 **Mo.1.3**

High Energy X-ray Imaging for Industrial Application
M. Salamon, Fraunhofer EZRT, Fürth, Germany

11:00 Break

Mo.2
DIMENSIONAL COMPUTED TOMOGRAPHY
Chair: M. Bartscher

11:30 **Mo.2.1**

Preliminary Results of the 'CT Audit' Project: First International Intercomparison of Computed Tomography Systems for Dimensional Metrology
A. Pierobon, University of Padova, Padova, Italy; S. Carmignato, University of Padova, Vicenza, Italy

12:00 **Mo.2.2**

Accuracy Evaluation and Exploration of Measurement Uncertainty for Exact Helical Cone Beam Reconstruction Using Katsevich Filtered Backprojection in Comparison to Circular Feldkamp Reconstruction with Respect to Industrial CT Metrology
J. Muders, J. Hesser, University Medical Center Mannheim, Germany; A. Lachner, C. Reinhart, Volume Graphics, Heidelberg, Germany

12:30 **Mo.2.3**

Generation of High Quality 3D Surfaces by Computed Tomography and Optical Scanning Systems

M. Simon, U. Hilpert, Wenzel Volumetrik, Singen, Germany; S. Findeis, M. Krebs, topometric, Göppingen, Germany

13:00 Lunch

Mo.3

OPTIMISATION OF COMPUTED TOMOGRAPHY

Chair: M. Maisl

14:00 **Mo.3.1**

Simulation-Based Planning of Optimal Conditions for Industrial Computed Tomography

S. Kasperl, M. Franz, J. Hiller, S. Reisinger, Fraunhofer EZRT, Fürth, Germany; U. Schmid, Otto-Friedrich University of Bamberg, Germany

14:30 **Mo.3.2**

Scatter Correction by Modulation of Primary Radiation in Industrial X-ray CT

K. Schörner, M. Goldammer, J. Stephan, Siemens, München, Germany

15:00 **Mo.3.3**

Positional Stability of 2D X-ray Images for Computer Tomography

F. Vogeler, W. Verheecke, A. Voet, Lessius University College, Mechelen, Belgium; J.-P. Kruth, Katholieke Universiteit Leuven, Heverlee, Belgium; W. Dewulf, Leuven Engineering College, Leuven, Belgium

15:30 Break

Mo.4

COMPUTED TOMOGRAPHY APPLICATIONS

Chair: S. Kasperl

16:00 **Mo.4.1**

Method for Efficient Identification of Similar Work Pieces for X-ray Computed Tomography

C. Niggemann, R. Schmitt, WZL, RWTH Aachen, Germany

16:30 **Mo.4.2**

Multiresolution X-ray CT Imaging of Fiber Reinforced Composite Materials

M. Costin, D. Lazaro-Ponthus, S. Legoupil, CEA LIST, Gif-sur-Yvette, France; V. Kaftandjian, INSA Lyon, Villeurbanne, France

17:00 **Mo.4.3**

Material Dependent Thresholding for Dimensional X-ray Computed Tomography

Y. Tan, W. Dewulf, K. Kiekens, Leuven Engineering College, Leuven, Belgium; J.-P. Kruth, Katholieke Universiteit Leuven, Heverlee, Belgium; A. Voet, Lessius University College, Mechelen, Belgium

17:30 **Postershow and Exhibition**

Tu.1
PHASE CONTRAST IMAGING
Chair: J. Stephan

09:00 **Tu.1.1**

Phase Contrast Imaging with High Resolution Cone Beam X-ray Computed Tomography

J. Kastner, B. Plank, D. Salaberger, Upper Austria University of Applied Sciences, Wels, Austria

09:30 **Tu.1.2**

The Benefits and Challenges of Differential Phase Contrast Imaging for Material Science

I. Jerjen, T. Lüthi, U. Sennhauser, EMPA, Dübendorf, Switzerland; R. Kaufmann, C. Kottler, V. Revol, C. Urban, CSEM, Zürich, Switzerland

10:00 **Tu.1.3**

Application of Phase Contrast Tomography in Laboratory-Based X-ray Micro-CT

M.N. Boone, W. Devulder, M. Dierick, L. Van Hoorebeke, Ghent University, Belgium

10:30 Break

Tu.2
RADIOGRAPHIC SIMULATION
Chair: V. Rebuffel

11:00 **Tu.2.1**

Experimental Validation of Build-Up Factor Predictions of Numerical Simulation Codes

A. Schumm, EDF R&D, Clamart, France; D. Roué, Institut du Soudure, Roissy, France

11:30 **Tu.2.2**

Simulating the Detection and Measurement of Ionizing Radiation

M. Zhukovskiy, S. Podoliako, Russian Academy of Sciences, Keldysh Institute, Moskau, Russia; M. Skachkov, National Researching Nuclear University „MEPHI“, Moscow, Russia

12:00 **Tu.2.3**

On POD Estimations with Radiographic Simulator aRTist

C. Gollwitzer, C. Bellon, A. Deresch, U. Ewert, G.-R. Jaenisch, BAM, Berlin, Germany

12:30 Lunch

Tu.3

µCT APPLICATIONS

Chair: J. Goebbels

13:30 **Tu.3.1**

µ-Computed Tomography for 3D Porosity Evaluation in Carbon Fibre Reinfored Plastics (CFRP)

R. Stößel, D. Kiefel, EADS-IW, München, Germany; B. Diewel, R. Oster, Eurocopter Deutschland, München, Germany; L. Llopart, Premium Aerotec, Augsburg, Germany

14:00 **Tu.3.2**

High Resolution Industrial CT Systems: Advances and Comparison with Synchrotron-Based CT

E. Neuser, O. Brunke, A. Suppes, GE Sensing & Inspection Technologies, Wunstorf, Germany

14:30 **Tu.3.3**

Application of the DIRECTT Algorithm to Sub-Nanometer Electron Tomography

A. Kupsch, M.P. Hentschel, A. Lange, BAM, Berlin, Germany; R. Grothausmann, I. Manke, Helmholtz-Zentrum Berlin, Germany

15:00 Break

Tu.4

QUALIFICATION

Chair: U. Zscherpel

15:30 **Tu.4.1**

Determining the Spatial Resolution in Computed Tomography – Comparison of MTF and Line-Pair Structures

A. Staude, J. Goebbels, BAM, Berlin, Germany

16:00 **Tu.4.2**

Moving from Traditional Specs to Specs as per ASTM for Digital Detector Arrays

R. Venkatachalam, GE Sensing & Inspection Technologies, Lewistown, USA

16:30 **Tu.4.3**

Using Calibrated Parts and Integral Surface Analysis to Investigate Dimensional CT Measurements

V. Camargo Nardelli, Federal University of Santa Catarina, Florianópolis, Brazil; F. A. Arenhart, G.D. Donatelli, M. de Campos Porath, CERTI Foundation, Florianópolis, Brazil

17:00 **Tu.4.4**

Towards a Society for Tomography

P. Jacobs, Ghent University, Belgium; D. Bernard, ICMCB-CNRS, Pessac, France

19:30 – 23:00 Conference Evening by Boat
(19:00 h Bustransfer)

We.1
FILM REPLACEMENT AND STANDARDS
Chair: V. Kaftandjian

09:00 **We.1.1**

Strategies for Film Replacement in Radiography – Approaches Used in the New Standards

U. Zscherpel, U. Ewert, M. Jechow, BAM, Berlin, Germany; K. Bavendiek, YXLON International, Hamburg, Germany

09:30 **We.1.2**

Feasibility of a Novel Prototype Storage Phosphor Image Plate Concept for NDT Applications

P. Willems, GE Sensing & Inspection Technologies, Berchem, Belgium

10:00 **We.1.3**

Qualification of Two Tube Inspection Systems for High Quality in-Process Digital Radiographic Testing of Longitudinal Welded Tubes

M. Bernard, A. Krüger, TÜV Nord EnSys, Hannover, Germany; J. Müller, H. Lindenschmidt, H. BUTTING, Knesebeck, Germany

10:30 Break

We.2
OTHER X-RAY APPLICATIONS
Chair: C. Sauerwein

11:00 **We.2.1**

New Perspectives of X-Ray Techniques for Explosive Detection based on CdTe/CdZnTe Spectrometric Detectors

V. Rebuffel, J. Rinkel, J. Tabary, L. Verger, CEA-LETI, Grenoble, France

11:30 **We.2.2**

New Portable and Autonomous Dual X-ray System for NDT and Security Applications

M. Iovea, A. Caescu, G. Mateiasi, M. Neagu, Accent Pro 2000, Bucharest, Romania; O. Duliu, University of Bucharest, Romania

12:00 **We.2.3**

Advanced Digital Radiography for Field NDT

R. Pincu, O. Kleinberger-Riedrich, Vidisco, Or-Yehuda, Israel

12:30 Lunch

We.3

3D RECONSTRUCTION ALGORITHMS

Chair: M. Simon

13:30 **We.3.1**

Geometric Corrections in Coplanar Translational Laminography

K.-U. Thiessenhusen, U. Ewert, B. Redmer, BAM, Berlin, Germany; K. Bavendiek, YXLON International, Hamburg, Germany

14:00 **We.3.2**

Comparative Study of Different Reconstruction Algorithms Applied to the Limited Data X-ray Tomography

V.V. Vengrinovich, S. Zolotarev, Institute of Applied Physics, Minsk, Belarus

14:30 **We.3.3**

Comparison of Computer-Laminographic Methods Regarding their Industrial Applicability

M. Maisl, F. Porsch, Fraunhofer EZRT, Saarbrücken, Germany; C. Schorr, Saarland University, Saarbrücken, Germany

15:00 Break

We.4

IMAGE PROCESSING

Chair: M. Kurfiß

15:30 **We.4.1**

Interest of Data Fusion for Improvement of Classification in X-ray Inspection

A. Osman, U. Haßler, Fraunhofer EZRT, Fürth, Germany; V. Kaftandjian, INSA Lyon, Villeurbanne, France

16:00 **We.4.2**

An Image Processing Approach for Radioscopic Inspection of Turbine Blades

U. Haßler, M. Rehak, Fraunhofer IIS, EZRT, Fürth, Germany

16:30 **We.4.3**

Application of an Industrial CT Reference Standard for Cast Free-Form Shaped Work Pieces

M. Bartscher, U. Neuschaefer-Rube, PTB, Braunschweig und Berlin, Germany; K. Ehrig, J. Goebbels, A. Staude, BAM, Berlin, Germany

17:00 Closing Remarks

P1 **Enhancing the Photon Flux With Helical CT**
B. Illerhaus, A.-C. Paschold, BAM, Berlin, Germany

P2 **Comparison of Crack Detection Methods for Analyzing Damage Processes in Concrete with Computed Tomography**
K. Ehrig, J. Goebbels, D. Meinel, BAM, Berlin, Germany; O. Paetsch, S. Prohaska, V. Zobel, Konrad-Zuse-Institut Berlin (ZIB), Germany

P3 **Automatic X-ray Inspection with Dynamic Reference Data Sets**
T. Stocker, T. Wenzel, Fraunhofer IIS, Fürth, Germany

P4 **Modelling Computed Radiography Detectors with a Cascaded Linear System Model**
A. Schumm, EDF R&D, Clamart, France; F. Mathy, P. Hugonnard, J. Tabary, CEA-LETI, Grenoble, France

P5 **Simulation Aided Study for Optimising Industrial X-ray CT Scan Parameters for Non-Destructive Testing and Materials Characterisation**
M. Reiter, B. Harrer, C. Heinzl, J. Kastner, D. Salaberger, Upper Austria Univ. of Applied Sciences, Wels, Austria; C. Kuhn, Carl Zeiss Industrielle Messtechnik, Oberkochen, Germany

P6 **Fast Estimation of Optimal Specimen Placements in 3D X-ray Computed Tomography**
C. Heinzl, J. Kastner, M. Reiter, Upper Austria University of Applied Sciences, Wels, Austria; A. Amirkhanov, E. Gröller, Technische Universität, Wien, Austria

P7 **Compensation of Scintillator Sensitivity Loss due to Irradiation Damage**
F. Guillet, CEA, Monts, France; P. Mercier, CEA, Arpajon, France; C. Thiery, CEA, Paris, France; E. Lahalle, L. Marti, C. Moisan-Thooris, E3S-Supélec, Gif sur Yvette, France

P8 **Performances Comparison between a 2D Flat Panel X-ray Detector and a Virtual One Based On Linear Array X-Ray Detector Translation Technique**
M. Iovea, G. Mateiasi, M. Neagu, Accent Pro 2000, Bucharest, Romania; T. Craciunescu, I. Tiseanu, National Institute for Laser, Plasma and Radiation Physics, Bucharest, Romania

P9 Nondestructive Inspection of Metal Coated Plasma-Facing Composite Materials by X-ray Laminography

I. Tiseanu, T. Craciunescu, C. Dobrea, C. Ruset, A. Sima, National institute for Laser, Plasma and Radiation Physics, Bucharest, Romania; M. Iovea, Accent Pro 2000, Bucharest, Romania

P10 Quality Control of High Tension 3D NVEB-Weld Joints

M. Diebel, F.-W. Bach, J. Hauer, W. Reimche, Leibniz University Hanover, Garbsen, Germany

P11 Linearity of Flat Panel X-ray Detectors and Comparison of Non-Linear Correction Algorithms

T. Hofmann, I. Bauscher, F. Nachtrab, N. Uhlmann, Fraunhofer EZRT, Fürth, Germany

P12 Parameter Dependent Thresholding for Dimensional X-ray Computed Tomography of Mono-Material Objects

K. Kiekens, W. Dewulf, Y. Tan, Leuven Engineering College, Leuven, Belgium; J.-P. Kruth, Katholieke Universiteit Leuven, Heverlee, Belgium; A. Voet, Lessius University College, Mechelen, Belgium

P13 Basis Material Decomposition – A Quantitative X-ray Imaging Method and its Application in Industrial Sorting

J. Mühlbauer, M. Firsching, F. Nachtrab, Fraunhofer EZRT, Fürth, Germany; A. Jobst, Fraunhofer IIS, Erlangen, Germany

P14 Limited View Tomography of Wood with Fast and Thermal Neutrons

K. Osterloh, U. Ewert, D. Fratzscher, M. Jechow, U. Zscherpel, BAM, Berlin, Germany; A. Hasenstab, Ingenieurbüro Dr. Hasenstab, Augsburg, Germany; T. Bücherl, B. Schillinger, TU München, Garching, Germany

P15 Design of Quality Control Phantoms and Protocol for a Tomography System

L. Franco, AIMEN, Porrino, Spain

P16 Material Identification Methods in Spectral Radiography using CdTe Semiconductor Detectors
V. Rebuffel, G. Beldjoudi, A. Brambilla, J. Rinkel, CEA-LETI, Grenoble, France

P17 Simulation of Complex Scan Paths for 3D Reconstruction
C. Bellon, U. Ewert, D. Fratzscher, C. Gollwitzer, G.-R. Jaenisch, BAM, Berlin, Germany

P18 Feature-Preserving CT Data Reduction Method Based on Elastic Volume Deformation
S. Kang, D. Kim, H. Park, Y. Shin, Seoul National University, South Korea

P19 Quantitative Dimension Measurement of Laser Target Components Using Hamamatsu Microfocus Source
A. Choux, G. Geoffray, C. Hermerel, L. Jeannot, O. Legaie, CEA, Is-sur-Tille, France

P20 A Framework for Defective Cells Detection on a X-ray Detector based on 3D Cone-Beam CT
D. Kim, Y. Shin, Seoul National University, South Korea; S. Jang, K. Kim, J. Yoon, 3D Industrial Imaging, Seoul, South Korea

P21 Single Crystal Scintillator Plates Used in Micro-CT Application
J. Tous, K. Blazek, P. Horodysky, Crytur, Turnov, Czech Republic; J. Mares, M. Nikl, Academy of Sciences of the Czech Republic, Institute of Physics, Prague, Czech Republic

P22 X-ray Measurement of Cluster Velocity and Acceleration in the Near Wall Region
F. Meng, W. Wang, J. Li, Institute of Process Engineering, Chinese Academy of Science, Beijing, China

P23 Dependence of Signal-to-Noise Ratio on Radiation Energy and Grey Value in Digital Industrial Radiology
M. Jechow, U. Ewert, U. Zscherpel, BAM, Berlin, Germany

P24 Correction of Diffuse X-Ray Detector Based Background
A. Lange, M.P. Hentschel, A. Kupsch, B.R. Müller, BAM, Berlin, Germany

P25 Investigations on Grading of Testing Results in Digital Radiographic Testing
C. Sun, China Academy of Engineering Physics, Mianyang, China

P26 A Gantry Based Micro-CT Scanner for Material Research
M. Dierick, M.N. Boone, B. Masschaele, L. Van Hoorebeke, D. Van Loo, Ghent University, Belgium

P27 A Modular Multi-Resolution X-ray CT Setup for Multi-Scale Imaging
D. Van Loo, M.N. Boone, M. Dierick, B. Masschaele, J. Van Acker, J. Van den Bulcke, P. Jacobs, L. Van Hoorebeke, D. Vansteenkiste, Ghent University, Belgium

P28 Morpho+: a Software Package for the Three-Dimensional Analysis of X-Ray Computed Tomography Data
J. Vlassenbroeck, inCT, Gent, Belgium; M.N. Boone, L. Brabant, V. Cnudde, J. Dewanckele, L. Van Hoorebeke, Ghent University, Belgium

P29 Scattered Radiation Grids Used for Micro Computed Tomography
B. Illerhaus, BAM, Berlin, Germany; S. Arnold, PerkinElmer Technologies, Walluf, Germany

P30 Computed Tomography Image Processing – Automated Analysis on GFRP Helicopter Rotor Blades
B. Diewel, R. Oster, Eurocopter Deutschland, München, Germany; T. Dierig, T. Günther, Volume Graphics, Heidelberg, Germany

P31 Computerized Tomography for Huge Objects from Aerospace Industry
S. Oeckl, Fraunhofer IIS, Fürth, Germany

P32 Scope and Limitations of a Simple Model Explaining the Variation of the Normalized SNR-Exposure Response Measured at Different Exposure Energies
P. Willems, GE Sensing & Inspection Technologies, Berchem, Belgium

P33 Evaluation of Welded Shipbuilding Steel Plates with a Compact Computed Radiographic System
A. Shinohara, E. Lundgren, UFPE, Recife, Brazil; S. Estefen, UFRJ, Rio de Janeiro, Brazil