

# **14th International Conference on Digital Printing Technologies 1998**

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# The Papers Program

## Keynote Papers 8:00 – 8:45 a.m.

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Wednesday	<b>The Internet-Ready Paper Based Communications Solution</b> , Yoshihiro Ida	1
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## Track I

Monday Morning, October 19, 1998

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Arthur Soucemarianadin, Univ. J. Fournier*

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*Session Chairs: Robert Cornell, Lexmark Int'l. Co; Eiichi Suzuki, Canon;  
Arthur Soucemarianadin, Univ. J. Fournier*

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*\*not available at time of publication*

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*Session Chair: Vince Cahill, IT Strategies*

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11:30	<b>Technological Peculiarities of Reproduction of the Monochrome and Colour Image in High-Speed Electrographic Printing Machines,</b> Oleg Kharin and Emilis Suveizdis, Scientific Research Phototechnical Institute of Slavich Co., <i>Russia</i>	425

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### **ELECTROSTATIC MARKING PROCESSES (continues)**

*Session Chairs: Howard Mizes, Xerox Corporation; Koji Hirakura, Ricoh; Jan Van Daele, Xeikon*

1:10	<b>Particle Motion in Screw Feeder Simulated by Discrete Element Method,</b> Kei-ich Tanida, Kouji Honda, Nobuaki Kawano, Electrophotography Process Center 1st Dept. MITA Ind. Co., Ltd., <i>Japan</i> Toshihiro Kawaguchi, Toshitsugu Tanaka and Yutaka Tsuji, Department of Mechanical Engineering, Osaka University, <i>Japan</i>	429
1:30	<b>Solution for the Retransfer Mechanism of Color Imaging Process,</b> Yoshie Iwakura and Hirokazu Fujita, Sharp Corporation, Products Development Laboratories, <i>Japan</i>	432
1:50	<b>Single Dot Development and Threshold Laser Power on Laser Beam Printer,</b> Yuji Furuya, Katsuta Research Lab., Hitachi Koki Co., Ltd, <i>Japan</i>	436
2:10	<b>Electrostatic Toner Transfer to an Intermediate: Results from a Continuum Model,</b> Thomas N. Tombs, Office Imaging, Eastman Kodak Company, <i>USA</i>	440
2:30	<b>BREAK</b>	
3:00	<b>Effects of Existing Air on Fusing Temperature Field in Electrophotographic Printers,</b> Kazuki Takenouchi, Kazuaki Kawakita, Kyushu Institute of Design, <i>Japan</i> Masahiro Samei, Takuo Shimokawa, Kyushu Matsushita Electric Co., Ltd., <i>Japan</i>	444
3:20	<b>Edge and Core Bending Effects During Fusing</b>	*
	Kenneth Stack, Jim Perconti, and Bonnie Patterson, Eastman Kodak Company, <i>USA</i>	
3:40	<b>A Study of Background Development and Toner Charge Distribution on Photoconductors,</b> Takeo Yamaguchi and Hisao Kurosu, Electrophotography Development Center, Ricoh Co., Ltd., <i>Japan</i>	448
4:00	<b>The Effect of Magnetic Roller Field Uniformity on Print Quality in Electrophotography,</b> Joseph J. Burbage, John C. Briggs and Ming-Kai Tse, QEA, Inc., <i>USA</i>	452
4:20	<b>The Effect of Fusing on Gloss in Electrophotography,</b> John C. Briggs, Ming-Kai Tse, QEA, Inc., <i>USA</i> ; David A. Telep, John Cavanaugh, Rexam Graphics, <i>USA</i>	456

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	<b>Estimation of Temperature in Toner Fusing Field,</b> Masahiro Samei, Takuo Shimokawa, Kyushu Matsushita Electric Co., Ltd., <i>Japan</i> Kazuki Takenouchi* and Kazuaki Kawakita, Kyushu Institute of Design, <i>Japan</i>	466

<b>Toner Charging in Developing Process,</b> Hiroshi Suzuki and Yasushi Hoshino, Nippon Institute of Technology, <i>Japan</i>	470
<b>Characteristics of Experimental Transportation Systems for Charged Toner Particles,</b> Keiji Taniguchi, Jun Mizukami, Yataka Nakano, Sadakazu Watanabe, Takanori Sakai, Syuichi Morikuni and Hiroaki Yamamoto, Information Science Department, Fukui University, <i>Japan</i> Yoichi Yamamoto, Product Development Labs., Printing and Reprographic Systems Group, Sharp Corporation, <i>Japan</i>	473
<b>Electrical Characteristics of the Oscillatory Toner Sensor for Measuring the Charge-to-Mass Ratio (q/m)</b> Keiji Taniguchi, Kensuke Fukumoto, Yataka Nakano, Sadakazu Watanabe, Takanori Sakai and Hiroaki Yamamoto, Information Science Department, Fukui University, <i>Japan</i> Yoichi Yamamoto, Product Development Laboratories, Printing and Reprographic Systems Group, SHARP Corporation, <i>Japan</i>	477
<b>The Role of Dielectric Relaxation Charge Roller Performance,</b> Ming-Kai Tse and Inan Chen, QEA, Inc., <i>USA</i>	481

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### PHOTORECEPTORS

*Session Chairs: Michel Molaire, Eastman Kodak Co.;*  
*Shinji Aramaki, Mitsubishi Chemicals; Jin Mizuguchi, Yokohama National Univ.;*  
*Manfred Lutz, AEG Elektrofotografie*

9:20 <b>Free-Volume Trapping in Multiactive Photoconductors,</b> Michel F. Molaire, Eastman Kodak Company, <i>USA</i>	486
9:45 <b>Transient Response of Multiplied Photocurrent Observed in Metal/ Organic Pigment Film Interface,</b> Ken-ichi Nakayama, Masahiro Hiramoto, and Masaaki Yokoyama, Material and Life Science, Faculty of Engineering, Osaka University, <i>Japan</i> ; CREST, Japan Science and Technology Corporation, <i>Japan</i>	490
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10:40 <b>Photoconduction in Polysilane Film,</b> Yoshikazu Nakayama, Akira Saito and Seiji Akita, Department of Physics and Electronics, Osaka Prefecture University, <i>Japan</i>	494
11:05 <b>Carrier Transport Properties of Calamitic Liquid Crystalline Photoconductors,</b> Jun-ichi Hanna and Masahiro Funahashi, Imaging Science and Engineering Laboratory, Tokyo Institute of Technology, <i>Japan</i>	498
11:30 <b>Electron Trapping in N,N(-bis(1,2-dimethylpropyl)-1,4,5,8-Naphthalenetetracarboxylic Diimide Doped Poly(styrene),</b> P. M. Borsenberger, W. T. Gruenbaum, E. H. Magin, and S. A. Visser, Office Imaging Division, Eastman Kodak Company, <i>USA</i> D. E. Schildkraut, Imaging Research and Advanced Development, Eastman Kodak Company, <i>USA</i>	502

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*Shinji Aramaki, Mitsubishi Chemicals; Jin Mizuguchi, Yokohama National Univ.;*  
*Manfred Lutz, AEG Elektrofotografie*

1:10 <b>Analysis of Photogeneration in Organic Photoconductors Based on Azo Pigments and Hydrazone Compounds Using Thermally Stimulated Current,</b> Takayuki Shoda, Shinji Aramaki, and Tetsuo Murayama, Mitsubishi Chemical Corporation, Yokohama Research Center, <i>Japan</i>	508
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1:30	<b>The Nature of Titanylphthalocyanine Y-form Crystals in Photoreceptors,</b> Okimasa Okada, Fuji Xerox Co. Ltd., <i>Japan</i> Michael L. Klein, Laboratory for Research on the Structure of Matter, Univ. of Pennsylvania, <i>USA</i>	512
1:50	<b>Electronic Characterization of N,N'-Bis(2-phenylethyl)perylene-3,4:9,10-bis(di-carboximide) and its Application to Optical Disks,</b> Jin Mizuguchi, Department of Applied Physics, Faculty of Engineering, Yokohama National University, <i>Japan</i>	516
2:10	<b>Silsesquioxane Sol-Gel Materials as Overcoats for Organic Photoreceptors,</b> D. S. Weiss, W. T. Ferrar, and R. Cowdery-Corvan, Office Imaging Division, Eastman Kodak Company, <i>USA</i>	520
2:40	<b>Electrophotographic and Hole Transport Properties of Polycarbonates Doped by Organic Photoconductors and Their Light- and Corona Discharge Stabilization,</b> Konstantin K. Kochelev, Galina A. Kocheleva, Olga K. Kocheleva, Vladimir E. Golovin, Scientific Research Phototechnical Institute on Slavich Co., <i>Russia</i> Alek R. Tameev, Alexey A. Kozlov, Anatoly V. Vannikov, A. N. Frumkin Institute of Electrochemistry of the Russian Academy of Sciences, <i>Russia</i>	524
3:00	<b>BREAK</b>	
3:30	<b>Catalytic Dehalogenation Polymerization of 4,4'-Dihalogenetriphenylamines in the Presence of a Nickel Complex,</b> Olga K. Kocheleva, Sergey A. Lebedev, Boris V. Kotov, Eduard. S. Petrov, Karpov Institute of Physical Chemistry, <i>Russia</i> Alek R. Tameev, Alexey A. Kozlov, and Anatoly V. Vannikov, A. N. Frumkin Institute of Electrochemistry of the Russian Academy of Sciences, <i>Russia</i>	528
3:50	<b>Development of Negative Charge a-Si Photoreceptor Drum,</b> Akihiko Ikeda, Hideaki Fukunaga, Michinobu Tsuda, Photoreceptor Development Division, Thin Film Devices Group, Kyocera Corporation, <i>Japan</i>	532
4:10	<b>Resolution Improvement on a-Si Photoreceptor Drums,</b> Masamitsu Sasahara, Hideaki Fukunaga, Akihiko Ikeda, Kyocera Corp. <i>Japan</i>	535
4:30	<b>Sensitized and Intrinsic Carrier Generation in Phenethylperylene/Tritolylamine Thin Film Structures,</b> Zoran D. Popovic, Ah-Mee Hor, Xerox Research Centre of Canada, <i>Canada</i> Robin Cowdery, Eastman Kodak Company, <i>USA</i> Iltaf M. Khan, Joseph Goodman, Center for Photoinduced Charge Transfer, Univ. of Rochester, <i>USA</i>	539

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### PHOTORECEPTORS POSTERS

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	<b>Dependence of Photoreceptor Charging Characteristics on Pre-Exposure Conditions,</b> Chun-Wei Lin, Toshinori Nozaki, Gentec Co., Ltd., <i>Japan</i> Yasushi Hoshino, Nippon Institute of Technology, <i>Japan</i>	548
	<b>Influence of Phthalocyanine Doping on Photoconductivity of C<sub>60</sub> Thin Films,</b> Ryoichi Yasuda and Manabu Takeuchi, Department of Electrical and Electronic Engineering, Ibaraki University, <i>Japan</i>	552

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**PRINT AND IMAGE QUALITY**

*Session Chairs: Joyce Farrell, Hewlett Packard Labs; Makoto Matsuki, NTT Printech;  
Bernard Pineaux, Domaine Universitaere*

9:10	<b>Perception of Spatial Color Variation Caused by Mass Variations about Single Separations,</b> Nancy Goodman, Wilson Center for Research and Technology, Xerox Corporation, <i>USA</i>	556
9:30	<b>Does Error-Diffusion Halftone Texture Mask Banding?,</b> Amnon Silverstein and Brian Chu, Hewlett Packard Laboratories, <i>USA</i>	560
9:50	<b>Qualifying Image Quality from Pairwise Comparisons,</b> Tuo Wu, Hewlett Packard Company, <i>USA</i> Joyce Farrell and Amnon Silverstein; Hewlett Packard Laboratory, <i>USA</i>	564
10:10	<b>BREAK</b>	
10:40	<b>Halftone Color: Diffusion of Light and Dot Shape,</b> Geoffrey L. Rogers, Fashion Institute of Technology, <i>USA</i>	568
11:10	<b>How to Allocate Bits To Optimize Photographic Image, Quality,</b> Joyce E. Farrell, Hewlett Packard Laboratories, <i>USA</i>	572
11:30	<b>Significance of Paper Properties on Print Quality in CIJ Printing,</b> Jali Heilmann, Ulf Lindqvist, VTT Information Technology, <i>Finland</i>	577

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**PRINT AND IMAGE QUALITY (continues)**

*Session Chairs: Joyce Farrell, Hewlett Packard Labs;  
Makoto Matsuki, NTT Printech; Bernard Pineaux, Domaine Universitaere*

1:10	<b>Signal-to-Noise Ratio of Digital Photographs,</b> Rodney Shaw, Hewlett-Packard Research Laboratories, <i>USA</i>	582
1:30	<b>Structure-Adaptive Evaluation of Noise in Images for Automatic Image Quality Control,</b> Roman M. Palenichka, Institute of Physics and Mechanics, <i>Ukraine</i>	586
1:50	<b>Print Quality Analysis as a QC Tool for Manufacturing Inkjet Print Heads,</b> David J. Forrest, John C. Briggs and Ming-Kai Tse, QEA, Inc., <i>USA</i> Steven H. Barss, Spectra, Inc., <i>USA</i>	590
2:10	<b>Reliability Issues for Color Measurement in Quality Control Applications,</b> John C. Briggs, David J. Forrest, and Ming-Kai Tse, QEA, Inc., <i>USA</i>	595

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**PRINT AND IMAGE QUALITY POSTERS**

<b>Image Quality Measurement and Analysis on Ink Jet Output,</b> Ludwik Buczynski, Warsaw University of Technology, <i>Poland</i>	*
<b>The Importance of Objective Analysis in Image Quality Evaluation,</b> Dave Wolin, Kate Johnson and Yair Kipman, KDY Inc., <i>USA</i>	603
<b>Dependence of Print Quality on Minimum Dot Size and Binarization Method,</b> Shigeru Kitakubo and Yasushi Hoshino, Nippon Institute of Technology, <i>Japan</i>	607
<b>Application of Digital Imaging to Measure Print Quality,</b> William Lim, Suresh Mani, Flint Ink Corporation, <i>USA</i>	611

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## QUALITY CONTROL INSTRUMENTATION

*Session Chairs: Ming-Kai Tse, Quality Engineering Associates*

3:00	<b>Advances in Instrumented Defect Mapping Technology for Photoreceptors,</b> Ming-Kai Tse, David J. Forrest and Francis Y. Wong, QEA, Inc., USA	615
3:30	<b>Theory and Practice of a Small Toner-Charge-Spectrometer,</b> Andreas Küttner, Reinhold H. Epping, Epping GmbH, Germany; Reinhold Hess, Matthias G. Hackenberg, GMD German National Research Center for Information Technology, Institute for Algorithms and Scientific Computing (SCAI), Germany	623
3:50	<b>Automating Image Quality Analysis,</b> Dave Wolin, Kate Johnson, and Yair Kipman, KDY, Inc., USA	627
4:10	<b>Time-Resolved Studies of Color Bleed Diffusion Limited Reactions with a Micro-Reactor,</b> Robert J. Miller, RJM & Associates, USA	631
4:30	<b>New Developments in Measuring the Resistivity of Paper,</b> John R. Yeager, Keithley Instruments, Inc., USA Peter Yong Woon Lim, Union Camp Corporation, USA	632

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## QUALITY CONTROL INSTRUMENTATION POSTER

4:50	<b>New Method for Evaluation of Addition to Both the Surface and the Core of Toner Particles— Toner Analysis Using a Particle Analyzer,</b> Toshiyuki Suzuki, Yuuichi Ujigawa, and Hisao Takahara, Yokogawa Electric Corporation, New Business Operations Center, Japan	635
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Friday Morning, October 23, 1998

## PRODUCTION DIGITAL PRINTING

*Session Chairs: Sam Theodoulou, Delphax Systems; Werner Kuefner, EURO-DPC GmbH*

8:20	<b>Low-end Color Devices for Proofing?,</b> Gary Dispoto, Hewlett-Packard Company, USA Michael Has, FOGRA Institute, Germany	639
8:40	<b>Specific Electronic Architecture for Large Width Ink-Jet Printing,</b> Patrice Giraud and Eric Auboussier, ARDEJE, France	643
9:00	<b>Interaction between Surface of a Master Cylinder and Ink Jet Imaging for Computer-to-Press Applications,</b> Arved Carl Hübler, Magdy Abd El Kader, Andreas Maurer, and Frank Hempel, Chemnitz Technical University, Germany	646
9:20	<b>Architecture and Design of a High Resolution, Wide Format Printing System for Check Production,</b> Peter J. Wood, Check Technology Corporation, USA	649
9:40	<b>BREAK</b>	
10:10	<b>PRINT-IT: A European Print on Demand Project,</b> Werner Kuefner, EURO-DPC GmbH, Germany	*
10:30	<b>Digital Printing Front-End Systems: A Case Study of a Large Scale Variable Field, Hybrid System,</b> William J. Ray, Group InfoTech, Inc., USA	655
10:50	<b>Digital Printing Front-Ends,</b> Pierre Vennekens, Agfa Gevaert N.V., Belgium	663
11:00	<b>Automating Page Creation with the use of Contextual Information,</b> Michael Has, Ute Klotzbücher, Christian Luidl, Fogra Institute, Germany	667