Volume 5405 Thermosense XXVI


Conference Committee

SESSION 1
RADIATION THERMOMETRY AND CALIBRATION

Infrared spectral emissivity characterization facility at NIST [5405-1]
L. Hanssen, S. Mekhontsev, V. Khromchenko

Emissivities of ceramics for temperature measurements [5405-3]
W. Bauer, A. Moldenhauer

Multispectral infrared BRDF forward-scatter measurements of common black surface preparations and materials—or “how black is black in the IR?” [5405-4]
J. Miller

Multispectral expert system spectropyrometer and its uses in industry and research [5405-5]
R. Felice

SESSION 2
MEDICAL THERMOMETRY FOR SARS DETECTION I

Human radiation thermometry and screening for elevated body temperature in humans [5405-6]
G. Peacock

New blackbody standard for the evaluation and calibration of tympanic ear thermometers at the NPL, United Kingdom [5405-7]
H. McEvoy, R. Simpson, G. Machin

Noninvasive temporal artery thermometry: physics, physiology, and clinical accuracy [5405-8]
F. Pompei, M. Pompei

SESSION 3
MEDICAL THERMOMETRY FOR SARS DETECTION II

Development and deployment of infrared fever screening systems [5405-11]
Y. Tan, C. Teo, E. Ong, L. Tan, M. Soo

Types of thermal imaging systems for mass fever screening and their evaluations [5405-12]
L. Wang, S. Chua, V. Tan

Infrared thermographic in identification of human elevated temperature with biostatistical and ROC analysis [5405-13]
E. Ng, G. Kaw, K. Ng

Stop outbreak of SARS with infrared cameras [5405-14]
M. Wu
SESSION 4
MEDICAL AND BIOLOGICAL APPLICATIONS

Differential thermal wave radiometry for noninvasive blood glucose monitoring: feasibility analysis [5405-15]
S. Telenkov

IR imaging of blood circulation of patients with vascular disease [5405-17]
H. Wang, D. Wade, Jr., J. Kam

SESSION 5
BUILDINGS AND INFRASTRUCTURE

Advances in applications and methodology for aerial infrared thermography [5405-19]
G. Stockton

Air tightness monitoring by IR thermography [5405-20]
E. Grinzato, S. Marinetti, P. Bison

Thermographic investigation of a circa 1920s building with water intrusion problems [5405-21]
K. Knettel

IRT in the investigation of buildings and historic structures [5405-23]
N. Avdelidis, A. Moropoulou

Study and characterization of a propane heat pump installation by the use of infrared thermography techniques [5405-24]
R. Royo, J. Gonzálvez, E. Navarro

Infrared image synthesis for bridges [5405-25]
Z. Jiang, Z. Wang, T. Zhou, J. Jin, Q. Peng

New model for realistic IR image rendering of city buildings [5405-26]
Z. Wang, Z. Jiang, S. Liu, Q. Peng

SESSION 6
ENVIRONMENTAL IMAGING AND FIRE DETECTION

Optical implementation of cubic-phase distribution lenses for passive infrared motion sensors [5405-29]
G. Cirino, L. Neto, R. Mansano

Monitoring active volcanoes using a handheld thermal camera [5405-30]
S. Calvari, L. Lodato, L. Spampinato

SESSION 7
INDUSTRIAL AND MANUFACTURING PROCESSES

GIS diagnostics: thermal imaging systems used for poor contact detection [5405-31]
D. Avital, V. Brandenbursky, A. Farber

Furnace wall-tube monitoring with a dual-band portable imaging radiometer [5405-32]
K. Irani

Advanced multispectral dynamic thermography as a new tool for inspection of gas-fired furnaces [5405-33]
P. Pregowski, G. Goleniewski, W. Komosa, W. Korytkowski

Thermographic survey inside chemical tankers [5405-34]
P. Gaggero, R. Dambra

Locating levels in tanks and silos using infrared thermography [5405-35]
J. Snell, M. Schwoegler

Benefits of using infrared thermography in utility substations [5405-38]
M. Kregg
SESSION 8
R & D

Passive thermal imaging of bullets in flight [5405-40]
A. Richards, D. Risdall

Prediction of submicron junction temperatures in microelectronics using IR techniques [5405-42]
A. Darwish, A. Bayba, H. Hung

Lie detection using thermal imaging [5405-43]
I. Pavlidis

Thermal imaging application for behavior study of chosen nocturnal animals [5405-44]
P. Pregowski, E. Owadowska, J. Pietrzak

Spectral selection in infrared imaging [5405-45]
A. Richards

SESSION 9
IR CAMERA TECHNOLOGY FOR ADVANCED APPLICATIONS

Nonuniformity correction and thermal drift compensation of thermal infrared camera [5405-47]
O. Riou, S. Berrebi, P. Bremond

Flexible camera applications of an advanced uncooled microbolometer thermal imaging core [5405-48]
R. Rumbaugh, S. Pongratz, T. Breen, H. Wickman, R. Klug, A. Gess, J. Hays, J. Bastian, G. Hall, T. Arion,
J. Owens, D. Siviter

SESSION 10
NDT-SONIC IR

Status of VibroIR at Lawrence Livermore National Laboratory [5405-53]
M. Burke, W. Miller

A design-of-experiments approach to characterizing the effects of sonic IR variables [5405-55]
D. Mayton, F. Spencer

Experimental considerations in vibrothermography [5405-56]
S. Shepard, T. Ahmed, J. Lhota

SESSION 11
NDT

Evaluating the efficiency of data processing algorithms in transient thermal NDT [5405-58]
V. Vavilov

Defect depth retrieval from pulsed phase thermographic data on Plexiglas and aluminum samples [5405-59]
C. Ibarra-Castanedo, X. Maldague

Development of a new processing technique of sequential temperature data after pulse heating for quantititative nondestructive testing [5405-60]
T. Sakagami, S. Kubo, T. Endo, Y. Asakura

The thermal photocopier: a new concept for thermal NDT [5405-61]
D. Woolard, K. Cramer

Improved sampling of thermal transients using focal plane array infrared imagers [5405-63]
J. Zalameda, W. Winfree

Inspection and evaluation of laser welds for transit buses [5405-64]
H. Wang, Z. Feng, P. Sklad
Transient thermographic technique for NDI of aerospace composite structures [5405-65]
R. McCullough

Thermal transient thermographic NDT and E of composites [5405-67]
N. Avdelidis, D. Almond, A. Dobbinson, B. Hawtin, C. Ibarra-Castanedo, X. Maldague

NDE of fiber-reinforced polymer composites bonded to concrete using IR thermography [5405-68]
J. Brown, H. Hamilton III

SESSION 12
NDT (Continued)

NDT and E for the surface roughness of marble [5405-69]
N. Avdelidis, A. Moropoulou, E. Delegou, D. Almond

Using the theory of heat conduction in the IR thermographic inspection of rotating cement kilns [5405-70]
V. Torgunakov, V. Vavilov

SESSION 13
NDT-MATERIALS EVALUATION

Blind characterization of materials using single-sided thermography [5405-71]
S. Shepard, J. Lhota, Y. Hou, T. Ahmed

Method for measuring thermal diffusivity on bulk samples [5405-72]
F. Lakestani, A. Salerno, A. Volcan

Evaluating the mechanical behavior of notched SiC/SiC composites using thermoelastic stress analysis [5405-74]
A. Gyekenyesi, G. Morscher

Quantitative thermoelastic stress analysis in non-adiabatic conditions [5405-75]
S. Desiderati, A. Salerno

Microcontroller signal density stress prediction framework [5405-76]
S. Hsieh, S. Huang, S. Chang

POSTER SESSION

Development and implementation of thermal signature testing protocol of auxiliary power unit (APU) and diesel tractor [5405-77]
C. Jenkins, S. Bourne, M. Rowley, J. Miles

Optimization of fiber-optic/infrared measurement system and spectral modeling for enhanced temperature acquisition from an aluminized polymer membrane [5405-78]
C. Smith, M. Rowley

Advanced surveillance systems: combining video and thermal imagery for pedestrian detection [5405-79]
H. Torresan, B. Turgeon, C. Ibarra-Castanedo, P. Hébert, X. Maldague

Study of fluctuation in fire with photoelectric sensor: assessment of the procedure [5405-80]
Q. Xu, G. Liao

Experimental study of radiant-heat blocking function of fine water mist suppressing small-scale pool fire [5405-81]
Q. Xu

The NPL wide-area MIR calibration source [5405-82]
M. Dury, E. Theocharous, N. Harrison, M. Hilton, N. Fox
SESSION 1
SWIR IMAGING AND RANGING

**InGaAs-on-Si photodetectors for high-sensitivity detection [5406-1]**
M. Bitter, Z. Pan, S. Kristjansson, L. Boman, R. Gold, A. Pauchard

**Characterization of InAlAs/InGaAs APD arrays for SWIR imaging applications [5406-2]**

**Range-gated imaging with an indium-gallium-arsenide-based focal plane array [5406-3]**
R. Brubaker, M. Ettenberg, M. O'Grady, M. Blessinger, J. Dries

**Visible response of \( \lambda_c = 2.5 \mu m \) HgCdTe HDVIP detectors [5406-4]**
M. Stapelbroek, M. Guptill, A. D'Souza, E. Bryan, J. Beck, M. Kinch, J. Robinson

**InGaAs/InP focal plane arrays for visible light imaging [5406-5]**
T. Martin, M. Cohen, J. Dries, M. Lange

**High-resolution SWIR arrays for imaging at night [5406-6]**
M. Ettenberg, M. Blessinger, M. O'Grady, S. Huang, R. Brubaker, M. Cohen

**Characterization of InGaSb detectors for 1.0- to 2.4-\( \mu m \) applications [5406-102]**

**1D InGaAs lock-in FPA [5406-104]**

SESSION 2
INFRARED OPTICS I

**IR imaging system with decreased hyperfocal distance [5406-7]**
K. Kubala, V. Chumachenko, A. Baron, E. Dowski, Jr.

**Wide field of view infrared imaging system design [5406-8]**
E. Rogala

SESSION 3
INFRARED OPTICS II

**An infrared modular panoramic imaging objective [5406-9]**
T. Palmer, C. Alexay

**Topaz: a novel design of a high-magnification athermalized 1:30 zoom in the MWIR [5406-10]**
Y. Aron, I. Boubis, R. Shavit

**Polymer imaging optics for the thermal infrared [5406-11]**
N. Claytor, R. Claytor

**Comparison of performances between GASIR molded optics and existing IR optics [5406-12]**
Y. Guimond, J. Franks, Y. Bellec

**Infrared micro-optics technologies [5406-13]**
D. Krogmann, H. Tholl
SESSION 4
DEVELOPMENT OF THIRD-GENERATION INFRARED IMAGERS I

A low-noise laser-gated imaging system for long-range target identification [5406-30]
I. Baker, S. Duncan, J. Copley

High-performance 2D MWIR Hg\textsubscript{1-x}Cd\textsubscript{x}Te array operating at 220K [5406-35]
N. Gordon, C. Jones, D. Lees, C. Maxey, T. Phillips, L. Hipwood, P. Haynes, R. Catchpole

Advanced large-format InSb IR FPA maturation at CMC Electronics [5406-36]
R. Rawe, A. Timlin, M. Davis, J. Devitt, M. Greiner

Albion camera: a high-performance infrared imaging system [5406-23]
D. Huckridge, T. Ashley, J. Beale, I. Blenkinsop, G. Bowen, D. Lees, T. Phillips, R. Price

Microspectrometer on a chip (MICROSPOC): first demonstration on a 320×240 LWIR HgCdTe focal plane array [5406-38]

Advanced IRFPAs for next-generation sensors [5406-39]
J. Caulfield, C. Fletcher, R. Graham, E. Patten, L. Pham, G. Pierce, D. Scribner, M. Skele, S. Taylor, W. Trautfeld

Third-generation focal plane array IR detection modules and applications [5406-40]

SESSION 5
COOLED FPAS AND APPLICATIONS

Lightweight, compact, and affordable MW TV-format IR detectors [5406-20]
P. Tribolet, P. Chorier, S. Dugalleix, S. Magli, P. Fillon, X. Brenière

Au- and Cu-doped HgCdTe HDVIP detectors [5406-21]
A. D’Souza, M. Stapelbroek, E. Bryan, J. Beck, M. Kinch, J. Robinson

480×384 element InSb detector with digital processor [5406-22]
O. Nesher, S. Elkind, I. Nevo, T. Markovitz, A. Ganany, A. Marhashev, M. Ben-Ezra

Third-generation infrared detector program at SCD [5406-37]

Device analysis of MBE HgCdTe p-on-n photovoltaic detectors in 5- to 15-µm wavelength range [5406-24]

Piccolo: a high-performance IR detector optimized for handheld applications [5406-25]
T. Markovitz, F. Schapiro, D. Alfiya, S. Hasson, A. Magner, O. Nesher

Multispectral high-speed midwave infrared imaging system [5406-26]

Infrared cameras for tracking and surveillance applications [5406-107]
E. Guyot

LWIR and VLWIR Hg\textsubscript{1-x}Cd\textsubscript{x}Te photoconductors with improved responsivity [5406-27]
G. Chekanova, I. Lartsev, M. Nikitin, V. Artyushenko, V. Lobachev, A. Drugova, V. Kholodnov, J. Ingram
SESSION 6
UNCOOLED MWIR FPAs

Progress on uncooled PbSe detectors for low-cost applications [5406-18]
G. Vergara, L. Gómez, V. Villamayor, M. Álvarez, M. Rodrigo, M. Torquemada, F. Sánchez, M. Verdú,
J. Diezhandino, P. Rodríguez, I. Catalán, R. Almazán, J. Plaza, M. Montojo

Low-cost PbSalt FPAs [5406-19]
T. Beystrum, R. Himoto, N. Jacksen, M. Sutton

SESSION 7
DEVELOPMENT OF THIRD-GENERATION INFRARED IMAGERS II

Navy DAS program for SBIRST [5406-28]
E. Takken, J. Waterman, K. Hepfer

Wide-FOV FPAs for a shipboard distributed aperture system [5406-29]
D. Gulbransen, S. Black, A. Childs, C. Fletcher, S. Johnson, W. Radford, G. Venzor, J. Sienicki, A. Thompson,
J. Griffith, A. Buell, M. Vilela, M. Newton, E. Takken, J. Waterman, K. Krapels

Long-wavelength infrared focal plane arrays fabricated from HgCdTe grown on silicon substrates [5406-31]
D. Hall, L. Buckle, N. Gordon, J. Giess, J. Hails, J. Cairns, R. Lawrence, A. Graham, R. Hall, C. Maltby, T. Ashley

LWIR MBE HgCdTe photovoltaic detectors grown on Si composite substrates [5406-32]
P. Wijewarnasuriya, G. Brill, Y. Chen, N. Dhar, S. Velicu

Vertically integrated sensor arrays: VISA [5406-33]
S. Horn, P. Norton, K. Carson, R. Eden, R. Clement

Quantitative study of high dynamic range Sigma-Delta-based focal plane array architectures [5406-34]
S. Kavusi, H. Kakavand, A. El Gamal

SESSION 8
SIGNAL PROCESSING IN AND BEHIND THE FOCAL PLANE

Folded multiple-capture: an architecture for high dynamic range disturbance-tolerant focal plane array [5406-14]
S. Kavusi, A. El Gamal

Large-format variable spatial acuity superpixel imaging: visible and infrared systems applications [5406-15]
P. McCarley, M. Massie, J. Curzan

A focal plane normal-flow measurement chip [5406-16]
S. Mehta, R. Etienne-Cummings

Digital emulation of analog components [5406-17]
T. Bartolac, P. McCarley

SESSION 9
UNCOOLED FPAS AND APPLICATIONS I

Progress report on development of the fire control system for the XM29 combat rifle [5406-42]
E. Brindley, J. Lillie, P. Plocki, R. Volz

Novel lightweight uncooled thermal weapon sight [5406-43]
A. Bergeron, H. Jerominek, J. Lacoursière, N. Desnoyers, C. Alain, P. Laou

Advanced packaging development for very low cost uncooled IRFPA [5406-44]
A. Astier, A. Arnaud, J. Ouvrier-Buffet, J. Yon, E. Mottin

Recent technology advancements and applications of advanced uncooled imagers [5406-45]
R. Blackwell, S. Geldart, M. Kohin, A. Leary, R. Murphy

New thermally isolated pixel structure for high-resolution uncooled infrared FPAs [5406-46]
S. Tohyama, M. Miyoshi, S. Kurashina, N. Ito, T. Sasaki, A. Ajisawa, N. Oda
Part Two

SESSION 10
PERFORMANCE LIMITS OF UNCOOLED FOCAL PLANE ARRAYS

Can the 300-K radiating background noise limit be attained by uncooled thermal imagers? [5406-47]
P. Kruse

Performance limits of uncooled VO\textsubscript{x} microbolometer focal plane arrays [5406-48]
M. Kohin, N. Butler

Barriers to background-limited performance for uncooled IR sensors [5406-49]
C. Hanson

SESSION 11
UNCOOLED FPAs AND APPLICATIONS II

Silicon foundry microbolometers: the route to the mass-market thermal imager [5406-51]
P. Manning, J. Gillham, N. Parkinson, T. Kaushal

Wafer-level self-packaged infrared microsensors [5406-52]
A. Mahmood, A. Dave, Z. Çelik-Butler, D. Butler

Progress in DRS production line for uncooled focal plane arrays [5406-108]

Night vision in Thales Angenieux: custom solutions for handheld devices [5406-54]
J. Rollin, J. Teszner, G. Delic, J. Espie, E. Sigonnaud

Pixel scaling for SOI-diode uncooled infrared focal plane arrays [5406-55]

Advances in uncooled 1-mil pixel size focal plane products at DRS [5406-56]
P. Howard, J. Clarke, A. Ionescu, C. Li, A. Frankenberger

Characterization of transfer-bonded silicon bolometer arrays [5406-110]
F. Niklaus, J. Pejnefors, M. Dainese, M. Häggblad, P. Hellström, U. Wållgren, G. Stemme

Performance improvements for VO\textsubscript{x}, microbolometer FPAs [5406-57]

A miniature infrared sight for both weapon-mounted and handheld security applications [5406-58]

Multipurpose high-performance 160×120 uncooled IRFPA [5406-59]
J. Tissot, A. Crastes, C. Trouilleau, B. Fieque, S. Tinnes

Microbolometer production at Indigo Systems [5406-60]

Fabrication of adaptive microbolometers [5406-61]
W. Song, J. Talghader

Design considerations for radiometer based on uncooled microbolometer detector [5406-105]
E. Grimberg
SESSION 12
QWIP FPAs AND APPLICATIONS

InP-based multiwavelength QWIP technology [5406-77]
A. Fathimulla, H. Hier, L. Aina, T. Worchesky, P. Uppal

Mid-wavelength infrared 1024×1024 pixel QWIP focal plane array [5406-78]

Optimization of corrugated QWIPs for high-speed infrared imaging [5406-79]
K. Choi, K. Leung, T. Tamir, C. Monroy, F. Wang, D. Tsui

Characterization of photocurrent of mid-wavelength quantum-well infrared photodetector (MW-QWIP) [5406-80]
Y. Uchiyama, H. Nishino, Y. Matsukura, K. Ozaki, T. Fujii

Recent progress in the application of large-format and multispectral QWIP IRFPAs [5406-81]
A. Goldberg, K. Choi

High-resolution QWIP thermal imager for AFV upgrade [5406-82]
A. Dahlberg

QWIP products and building blocks for high-performance systems [5406-83]
E. Costard, Ph. Bois, X. Marcadet, A. Nedelcu

Hyperspectral study of a 640×512 infrared focal plane array of QWIP technology [5406-84]
N. Guérineau, S. Rommeluere, I. Ribet-Mohamed, A. de Rossi, E. Costard

SESSION 13
TARGET ACQUISITION SYSTEMS AND RELATED ISSUES I

Signal processing innovations for flexible multipayload E/O system [5406-63]
C. Carter, S. Diamond, L. Kimes, S. Sandven

Handheld hyperspectral imager system for chemical/biological and environmental applications [5406-66]
M. Hinnrichs, B. Piatek

SESSION 14
TARGET ACQUISITION SYSTEMS AND RELATED ISSUES II

Progress towards a refractive real-time MWIR hyperspectral imager [5406-65]
B. Catanzaro, M. Dombrowski, P. Willson, J. Hendrixson, E. Hillenbrand, J. Wilcox

Impact flash: a tool for rapid battle damage assessment [5406-64]
G. Thomson, M. McNeir

Mosaic multispectral focal plane array cameras [5406-67]
R. Ramanath, W. Snyder, H. Qi

HuntIR thermal imagers for reconnaissance and targeting applications [5406-68]
R. Breiter, W. Cabanski, T. Ihle, K. Mauk, W. Rode

Estimating the source location using the Honeywell distributed sensor [5406-70]
J. Jelinek

Refractive effects, turbulence, and the EOSTAR model [5406-71]
S. Doss-Hammel, D. Tsintikidis, A. van Eijk, G. Kunz

Miniature embedded real-time image processor system for smart sensor systems [5406-75]
C. Baxter, T. Cicchi, M. Massie, P. McCarley

Step-scan method to enlarge the field of view of focal plane array cameras by continuously rotating optical elements [5406-101]
M. Assel, J. Barth
SESSION 15
CRYOCOOLERS FOR FOCAL PLANE ARRAYS

Reliability for tactical cryocoolers [5406-85]
H. Hoefelmeyer, R. Nelson, R. Nelson

Dynamically counterbalanced pneumatically driven expander of a split Stirling cryogenic cooler [5406-86]
A. Veprik, S. Riabzev, N. Pundak

Reliability enhancement of common module systems [5406-87]
G. Schellenberger, I. Rühlich, H. Korf, J. Petrie, R. Münter

Gaso-dynamic counterbalancer for pneumatically driven expander in rotary split Stirling cryocooler [5406-88]
S. Riabzev, A. Veprik, N. Pundak, U. Pratt, H. Vilenchik

Extending the operating temperature range of flexure-spring linear-drive cryocoolers [5406-89]
R. Rawlings

SESSION 16
SELECTED PAPERS ON INFRARED TECHNOLOGIES AND SENSORS

Experimental study and modelization of oblique incidence effect on QWIP’s spectral response [5406-90]

Novel surface treatment of HgCdTe using hydrazine [5406-91]
M. Lee, H. Lee

Design of dual-band SWIR/MWIR and MWIR/LWIR imagers [5406-92]
B. Catanzaro, M. Dombrowski, J. Hendrixson, E. Hillenbrand

Pyroelectric single-element detectors for special applications [5406-93]
V. Norkus, R. Köhler, G. Gerlach

Calibration method for IR channel of dual-band long-range airborne camera [5406-94]
V. Petrushhevsky

Emergency responders’ critical infrared (ERCI) [5406-96]
L. Konsin

Rapid prototyping in the development of image processing systems [5406-98]
A. von der Fecht, C. Kelm

Antenna-coupled infrared detectors [5406-95]
F. González, J. Porter, G. Boreman

Copper-doped GaAs filters for the 8- to 13-µm atmospheric window [5406-97]
F. Ruhe, R. Peale

Infrared frequency selective surfaces: design, fabrication, and measurement [5406-103]
B. Monacelli, J. Pryor, B. Munk, D. Kotter, G. Boreman
**Volume 5407 Infrared Imaging Systems: Design, Analysis, Modeling, and Testing XV**

**Chair/Editor: Gerald C. Holst**

**Conference Committee**

**TESTING**

**Uncertainties in the minimum resolvable temperature difference measurement [5407-4]**
S. Sousk, P. O'Shea, V. Hodgkin

**Determining stabilization accuracies of vibrationally excited FPA cameras by frame-to-frame measurements of MTF values [5407-5]**
J. Barth, M. Assel, T. Kuligk, Y. Polin, R. Pröls

**Measurement and laboratory-to-field data correlation techniques for airborne forward-looking infrared systems [5407-6]**
M. London, R. Wilder

**Test methods and technology for uncooled imaging systems [5407-8]**
S. Miller, B. Backer, M. Kohin, P. Alonso, J. Whitwam

**Advanced test systems for characterization of UUTs with laser range finder/designator capabilities [5407-9]**
J. McKechnie, P. Bryant, P. Harris, J. Grigor, B. Rich, A. Irwin, S. McHugh

**Evaluation of thermal imaging cameras used in fire fighting applications [5407-34]**
F. Amon, N. Bryner, A. Hamins

**SYSTEMS**

**A chopper-free measurement-based parametric-fitting nonuniformity correction system [5407-10]**
H. Chen, F. Fontan, T. Olson

**Reducing size, weight, and cost in a LWIR imaging system with wavefront coding [5407-11]**
E. Dowski, K. Kubala

**Development of a high-performance spectral radiometer for EO calibration applications [5407-12]**
G. Matis, P. Bryant, J. James, S. McHugh

**RPro: radiometric data processor [5407-13]**
B. Cromwell, T. Wright, J. McClure

**MODELING I**

**Identifiability: a fast way to measure identification performance [5407-14]**
M. Hogervorst, A. Toet, P. Bijl, B. Miller

**Identification of military targets and simple laboratory test patterns in band-limited noise [5407-15]**
P. Bijl, M. Hogervorst, A. Toet

**Identification of handheld objects for electro-optic/FLIR applications [5407-16]**
S. Moyer, E. Flug, T. Edwards, K. Krapels, J. Scarbrough

**Benefits of microscan for staring infrared imagers [5407-17]**
J. Miller, J. Wiltse
MODELING II

Superresolution performance for undersampled imagers [5407-18]

Characterization of phase artifacts for focal plane arrays [5407-19]
J. López-Alonso, J. Alda

Predicting imaging performance in turbulence [5407-20]
S. Johnson, E. Jacobs, R. Vollmerhausen

Real-time control of uncooled microbolometer camera transfer function [5407-33]
E. Grimberg

MODELING, MULTISPECTRAL SYSTEMS I

Two-color HgCdTe focal plane detector simulation [5407-23]
T. Sanders, G. Hess, S. Eisert

Infrared focal plane array modeling for aerospace and automotive applications [5407-24]

Modeling active imager performance [5407-25]
E. Jacobs, R. Vollmerhausen, C. Halford

Predicting range performance of LRG imagers in the presence of natural illumination [5407-26]
T. Maurer, R. Vollmerhausen

MODELING, MULTISPECTRAL SYSTEMS II

Search comparison in the infrared spectra for military operations in the urban terrain [5407-28]
N. Devitt, E. Flug, S. Moyer, B. Miller, D. Wilson

Spatial characterization of light detectors with nanometric resolution [5407-31]

POSTER SESSION

Testing of electro-optical imaging systems [5407-32]
K. Chrzanowski, J. Barela, K. Firmanty

Development of a performance evaluation facility for fire fighting thermal imagers [5407-35]
F. Amon, V. Benetis, J. Kim, A. Hamins

Using a rotating test pattern for MTF measurement of staring array sensors [5407-36]
J. Fanning, S. Chari, C. Halford
Part A  Radar Sensor Technology VIII

SYNTHETIC APERTURE RADAR SYSTEMS AND IMAGING

A SAR imaging model for large-scale atmospheric inhomogeneities [5410-1]
F. Dickey, J. DeLaurentis, A. Doerry

Current radar-responsive tag development activities at Sandia National Laboratories [5410-2]
R. Ormesher, K. Plummer, L. Wells

Atmospheric loss considerations for synthetic aperture radar design and operation [5410-3]
A. Doerry

A portfolio of fine-resolution SAR images [5410-4]
A. Doerry, V. Gutierrez, L. Wells

Motion measurement for high-accuracy real-time airborne SAR [5410-5]
T. Kim

Image quality specification and maintenance for airborne SAR [5410-6]
M. Clinard

RADAR SIGNAL PROCESSING

Resolution issues in the analysis of radar signals via Fourier approaches [5410-7]
B. Flores, H. Ochoa, G. Thomas

Detecting slow moving targets in SAR images [5410-8]
R. Linnehan, L. Perlovsky, C. Mutz, J. Schindler

A methodology for characterizing phase noise in modulated radar waveforms: an alternative ‘terrain’ characterization method [5410-9]
J. Gray, S. Addison

Improving angular resolution with Scan-MUSIC algorithm for real complex targets using 35-GHz millimeter-wave radar [5410-10]
C. Ly

RADAR SYSTEMS AND TECHNIQUES I

Low-cost position-adaptive UAV radar design with state-of-the-art COTS technology [5410-13]
A. Mitra, K. Pasala

Inverse synthetic aperture radar imagery of a man with a rocket propelled grenade launcher [5410-14]
C. Tran, R. Innocenti, G. Kirose, K. Ranney, G. Smith

Passive position-adaptive radar modes for non-LOS interrogation of embedded targets [5410-15]
A. Mitra
RADAR SYSTEMS AND TECHNIQUES II

Using radar to help mitigate truck overturn incidents on US interstate highways [5410-18]
E. Greneker, E. Rausch

A kill chain architecture for prosecution of ground targets [5410-20]
A. Kerrick, A. Shaw

Colored Petri net simulation and modeling of air-to-ground targeting [5410-21]
A. Roy, A. Shaw, A. Kerrick

Low-cost Ka band SAR/ISAR for UAV applications [5410-23]
S. Kim, A. Pergande, J. Hughen

POSTER SESSION

Spatial statistical characteristics of land and development of radar clutter maps [5410-24]
G. Kulemin, E. Tarnavsky

UWB GPR for detection and identification of buried small objects [5410-27]
D. Armagan Sahinkaya, A. Turk

A portfolio of fine-resolution SAR images: continued [5410-28]
A. Doerry, V. Gutierrez, L. Wells

Part B  Passive Millimeter-Wave Imaging Technology VII

SYSTEMS

Active millimeter-wave video rate imaging with a staring 120-element microbolometer array [5410-29]
A. Luuknen, A. Miller, E. Grossman

Passive millimeter-wave focal plane array [5410-30]
C. Middleton, G. Zummo, A. Weeks, A. Pergande, L. Mirth, G. Boreman

Design and development of a high-performance passive millimeter-wave imager for aeronautical applications [5410-31]
A. Lettington, D. Dunn, N. Alexander, A. Wabby, B. Lyons, R. Doyle, J. Walshe, M. Attia, I. Blankson

Compact millimeter-wave medical imager [5410-32]
D. Robertson

Analysis of passive millimeter-wave imagery texture for enhanced aircraft obstacle avoidance [5410-33]
D. Wikner

Antenna-coupled MOM diodes for dual-band detection in MMW and LWIR [5410-34]
M. Abdel-Rahman, F. Gonzalez, G. Zummo, C. Middleton, G. Boreman

SECURITY

Whole-body 35-GHz security scanner [5410-37]
R. Appleby, R. Anderton, S. Price, G. Sinclair, P. Coward

Concealed weapons detection with an improved passive millimeter-wave imager [5410-38]
C. Martin, V. Kolinko

Polarimetric scene simulation in millimeter-wave radiometric imaging [5410-47]
N. Salmon
Passive interferometric millimeter-wave imaging: achieving big results with a constellation of small satellites [5410-40]
X. Shao, W. Junor, R. Zenick, A. Rogers, K. Dighe

Constrained image restoration for use in passive millimeter-wave imaging [5410-41]
A. Lettington, N. Alexander, E. Boukouvala

On spatial resolution of quasi-optical focal plane antenna array imagers [5410-42]
L. Volkov, A. Voronko, N. Volkova

Superresolution in the passive radiovision systems of millimeter-wave range [5410-44]
Y. Pirogov, V. Gladun, D. Tischenko, A. Tismanovskiy

Research on antenna-scanning mode and image displaying method of an 8-mm ground radiometric imaging system [5410-45]
L. Gui, W. Guo, Z. Zhang

Volume 5411 Terahertz for Military and Security Applications II

Spectroscopic characterization of explosives in the far-infrared region [5411-2]

Terahertz near-field interferometric and synthetic aperture imaging [5411-3]
K. Walsh, B. Schulkin, D. Gary, J. Federici, R. Barat, D. Zimdars

Micromachined antenna-coupled uncooled microbolometers for terahertz imaging arrays [5411-4]
A. Miller, A. Luukanen, E. Grossman

Terahertz signatures of biological-warfare-agent simulants [5411-5]

Terahertz wave imaging for landmine detection [5411-6]

Analysis of terahertz spectral images of explosives and bioagents using trained neural networks [5411-7]
F. Oliveira, R. Barat, B. Schulkin, F. Huang, J. Federici, D. Gary, D. Zimdars

Pulsed and widely tunable terahertz sources for security: imaging and spectroscopy [5411-8]
M. Hagmann, B. McBride, Z. Hagmann

Terahertz active direct detection imagers [5411-9]
E. Grossman, A. Luukanen, A. Miller

Terahertz reflection imaging for package and personnel inspection [5411-26]
D. Zimdars, J. White
**SESSION 4**

**TERAHERTZ TECHNOLOGIES I**

*Terahertz spectroscopy of explosives and related compounds [5411-10]*
M. Fitch, D. Schauki, C. Dodson, R. Osiander

*Generation and detection of pulsed T-rays for use in the study of biological and bioterrorism issues [5411-12]*
T. Jedju, B. Bosacchi, W. Warren, A. Nahata, T. Kuenstner

*Development of passive millimeter-wave imaging systems and its applications to medical- and bio-objects imaging [5411-29]*
M. Joung, Y. Suzuki, T. Tanaka, S. Kagaya, K. Watanabe, H. Matono, Y. Wagatsuma, K. Mizuno

**SESSION 5**

**TERAHERTZ TECHNOLOGIES II**

*Molecular devices operating at terahertz frequencies: theoretical simulations and perspectives [5411-13]*
J. Seminario

*Fabrication of terahertz two-dimensional photonic crystal lens on silicon-on-insulator [5411-14]*
C. Lin, C. Chen, G. Schneider, Z. Lu, D. Prather

*A superconducting antenna-coupled microbolometer for THz applications [5411-15]*
A. Luukanen, R. Hadfield, A. Miller, E. Grossman

*Diffraction optics for terahertz waves [5411-16]*
J. Wiltse

*Bioaerosol sampling system with replicated optics [5411-17]*
M. Gross, N. Cunningham, J. Erickson, C. Manning, A. Samuels

**SESSION 6**

**TERAHERTZ TECHNOLOGIES III**

*Tagless and universal biosensor for point detection of pathogens [5411-30]*
A. Markelz, J. Knab, J. Chen, J. Cerne, W. Cox

*Terahertz emission, detection, and military applications [5411-27]*
D. Wu, J. Meyer

*THz time domain sensing and imaging [5411-22]*
R. Cheville, M. Reiten, J. O’Hara, D. Grischkowsky

*Selectively doped germanium THz laser [5411-23]*
M. Dolguikh, A. Muravjov, R. Peale

*Gain improvement for the THz p-Ge laser using neutron transmutation doped active crystal [5411-24]*
Volume 5412 Laser Radar Technology and Applications IX
Chair/Editor: Gary W. Kamerman
Conference Committee

SESSION 1
ATMOSPHERIC SENSING

Airborne three-line mid-IR DIAL for rapid chemical species plume mapping [5412-1]
C. Grund, S. Shald, S. Stearns

Molecular optical air data system (MOADS) prototype II [5412-3]

Optical refraction measurements over sea surface with lidar [5412-4]
A. Hågård, R. Persson, K. Gustafsson

Atmospheric trace constituent detection by CW-FM-LD-ladar: a concept development [5412-53]

Single and double path laser link measurements over water [5412-63]
O. Steinvall, G. Bolander, L. Sjöqvist, M. Petersson, K. Gustafsson, F. Berglund, L. Allard, K. Karlsson, T. Larsson, F. Gustavsson

SESSION 2
INSTRUMENTATION & PHENOMENOLOGY

Performance evaluation facility for ladars [5412-5]
G. Cheok, W. Stone

Scanning Shack-Hartmann wavefront sensor [5412-9]
V. Molebny

Range precision of direct-detection laser radar systems [5412-10]
S. Johnson, T. Nichols, P. Gatt, T. Klausutis

Validar: a testbed for advanced 2-micron Doppler lidar [5412-11]
G. Koch, M. Petros, B. Barnes, J. Beyon, F. Amzajerdian, J. Yu, M. Kavaya, U. Singh

SESSION 3
COMPONENTS

Characterization of InGaAs self-mixing detectors for chirp amplitude-modulated lidar (CAML) [5412-12]

Eye-safe laser radar 3D imaging [5412-13]
R. Stettner, H. Bailey, R. Richmond

Eye-safe erbium glass laser transmitter study Q-switched with cobalt spinel [5412-14]
R. Wu, T. Chen, J. Myers, M. Myers, C. Hardy, J. Driver

Large-area InAlAs/InGaAs single photon counting avalanche photodiodes [5412-16]
J. Boisvert, G. Kinsey, D. McAlister, T. Isshiki, R. Sudharsanan, M. Krainak
SESSION 4
TACTICAL SYSTEMS

Airborne ladar man-in-the-loop operations in tactical environments [5412-18]
J. Grobmyer, Jr., T. Lum, R. Morris, S. Hard, H. Pratt, T. Florence, E. Peddycoart

High-speed multiple-object passive and active electro-optical tracking [5412-56]
J. Daugherty, P. Fairchild, V. Hasson, H. Hyman, D. Leslie

Design description and field testing of the SHOALS-1000T airborne bathymeter [5412-57]
P. LaRocque, J. Banic, A. Cunningham

Use of SHOALS bottom reflectance images to constrain the inversion of a hyperspectral radiative transfer model [5412-59]
G. Tuell, J. Park

SESSION 5
COHERENT SYSTEMS

High-fidelity ladar simulation [5412-24]
R. Telgarsky, M. Cates, C. Thompson, J. Sanders-Reed

Model of lidar range-Doppler signatures of solid rocket fuel plumes [5412-25]
I. Bankman, J. Giles, S. Chan, R. Reed

Direct-detection laser vibrometry with an amplitude-modulated ladar [5412-26]
B. Redman, W. Ruff, K. Aliberti

Spectral estimation of Doppler spread vibrating targets using coherent ladar [5412-52]
D. Youmans

SESSION 6
3D LASER RADAR

Hybrid 3D laser sensor based on a high-performance long-range wide-field-of-view laser scanner and a calibrated high-resolution digital camera [5412-31]
A. Ullrich, N. Studnicka, J. Riegler

A 32x32 pixel FLASH laser radar system incorporating InGaAs PIN and APD detectors [5412-32]
J. Dries, B. Miles, R. Stettner

High-accuracy 3D laser radar [5412-33]
J. Busch, H. Heiselberg

A 32x32 pixel focal plane array ladar system using chirped amplitude modulation [5412-37]
B. Stann, K. Aliberti, D. Carothers, J. Dammann, G. Dang, M. Giza, W. Lawler, B. Redman, D. Simon

Space Shuttle thermal protection system inspection by 3D imaging laser radar [5412-38]
J. Lamoreux, J. Siekierski, J. Carter

Obscuration measurements of tree canopy structure using a 3D imaging ladar system [5412-39]
R. Cannata, W. Clifton, S. Blask, R. Marino

3D laser sensing at FOI: overview and a system perspective [5412-40]

Methods for recognition of natural and man-made objects using laser radar data [5412-41]
C. Grönnwall, T. Chevalier, Å. Persson, M. Elmqvist, S. Ahlberg, L. Klasén, P. Andersson

Aided target recognition from 3D laser radar data [5412-42]
L. Klasén, P. Andersson, H. Larsson, T. Chevalier, O. Steinvall
Three-dimensional environment models from airborne laser radar data [5412-43]
U. Söderman, S. Ahlberg, M. Elmqvist, Å. Persson

Structural-surface extraction from 3D laser radar point clouds [5412-45]
J. Lersch, B. Webb, K. West

Processing of laser radar data for the extraction of an along-the-levee-crown elevation profile for levee remediation studies [5412-46]
M. Bishop, T. McGill, S. Taylor

Three-dimensional laser radar sensor modeling and validation via a Monte Carlo Rayleigh-Sommerfeld wave optics approach [5412-47]
S. Cain

Experimental investigations of the potential of commercial laser sources for spaceborne imaging laser sensors [5412-50]
A. Ullrich, J. Pereira do Carmo, G. Ulbrich

Volume 5413 Laser Systems Technology II

Chairs/Editors: William E. Thompson, Richard L. Brunson

Conference Committee

Introduction

KEYNOTE PRESENTATION

New technologies and architectures for laser systems: revolutionary beam control [5413-1]
P. McManamon, W. Thompson

SESSION 1
LASER SOURCE TECHNOLOGY

Advanced chemical lasers [5413-2]
G. Manke II, K. Hewett, T. Madden, J. McCord, C. Wisniewski, G. Hager

Dispersion-managed breathing-mode semiconductor mode-locked ring laser: experimental and numerical study [5413-3]
B. Resan, L. Archundia, P. Delfyett, Jr.

External-cavity actively mode-locked GCSEL (grating coupled surface emitting laser) and amplification characteristics of GCSOA (grating coupled surface emitting semiconductor optical amplifier) [5413-5]
K. Kim, S. Lee, O. Smolski, P. Delfyett, Jr.

Injection-locking efficiency of two independent lasers [5413-7]
R. Kurtz, R. Pradhan, N. Tun, T. Aye, G. Savant, T. Jannson, L. DeShazer

SESSION 2
ATMOSPHERIC CHARACTERIZATION

Atmospheric turbulence profile estimation using a single laser guide star [5413-10]
S. Cain

The design and implementation of a laser rangefinder/designator beam metrology system for beam characterization analysis through environmental and atmospheric conditions at the Crane division, Naval Surface Warfare Center (NSWC Crane) [5413-11]
C. Middlebrook, R. Bunch, B. Helms

Round-trip turbulence ladar scintillation modeling using data fits and resulting signal-to-noise ratio [5413-22]
D. Youmans
SESSION 3
LASER PROPAGATION PHENOMENOLOGY

Atmospheric-induced frequency fluctuations in LIDAR [5413-12]
A. Masino, C. Young

Impact of atmospheric turbulence on beam propagation [5413-13]
J. Strasburg, W. Harper

SESSION 4
LASER SYSTEMS APPLICATIONS

Fiber optic communication links suitable for onboard use in modern aircraft [5413-15]
H. Nguyen, D. Ngo, M. Atiquzzaman, J. Sluss, Jr., F. Slaveski, M. Alam

Anti-ship missile tracking with a chirped amplitude modulation ladar [5413-16]
B. Redman, B. Stann, W. Ruff, M. Giza, K. Aliberti, W. Lawler

Wavelength selection and propagation analysis for shipboard free electron laser [5413-19]
D. Leslie, M. Belen'kii

The magic of relay mirrors [5413-23]
E. Duff, D. Washburn

Volume 5416 Chemical and Biological Sensing V
Chair/Editor: Patrick J. Gardner
Conference Committee

SESSION 1
EMERGENCY RESPONSE AND BATTLEFIELD SUPPORT FOR CBRN HAZARDS

CT-Analyst: fast and accurate CBR emergency assessment [5416-1]
J. Boris, J. Fulton, Jr., K. Obenschain, G. Patnaik, T. Young, Jr.

Using CT-Analyst to optimize sensor placement [5416-2]
K. Obenschain, J. Boris, G. Patnaik

A composite CBRN surveillance and testing service [5416-4]
D. Niemeyer

Critical components required to improve deployable laboratory biological hazards identification [5416-5]
D. Niemeyer

SESSION 2
CHEMICAL AND BIOLOGICAL POINT DETECTION TECHNOLOGIES I

A linear ion trap for biological agent detection and identification [5416-6]
M. Griffin, S. McLuckey

Miniature photoacoustic chemical sensor using microelectromechanical structures [5416-7]
P. Pellegrino, R. Polcawich, S. Firebaugh

Reactive chromophores for sensitive and selective detection of chemical warfare agents [5416-8]
SESSION 3
CHEMICAL AND BIOLOGICAL POINT DETECTION TECHNOLOGIES II

Advancements in field-portable imaging radiometric spectrometer technology for chemical detection [5416-40]
M. Chamberland, C. Belzile, V. Farley, J. Legault, K. Schwantes

Miniature chemical and biomedical sensors enabled by direct-write microdispensing technology [5416-10]
D. Hayes, P. Cooley, D. Wallace

Mesoporous membrane technologies for the collection of airborne biological pathogens [5416-11]
N. Hovijitra, S. Lee, H. Shang, E. Wallis, G. Lee

Photonic nanostructures as SERS substrates for reproducible characterization of bacterial spores [5416-12]
J. Pendell Jones, N. Fell, Jr., T. Alexander, A. Fountain III

DNA capture elements for rapid detection and identification of biological agents [5416-13]
J. Kiel, J. Parker, E. Holwitt, J. Vivekananda

SESSION 4
ALGORITHMS, MODELING, AND SIMULATION: SIGNAL PROCESSING FOR CB DETECTION

Computational intelligence in biological sensing [5416-14]
J. Braun, Y. Glina, J. Su, T. Dasey

Agent identification and differentiation via abstract second messenger modeling [5416-15]
J. Peterson

Thermal infrared scene simulation for plume detection algorithm evaluation [5416-16]
R. Sundberg, S. Richtsmeier, A. Berk, S. Adler-Golden, M. Fox, R. Haren

Plume source detection using a process query system [5416-41]
G. Nofsinger, K. Smith

SESSION 5
DARPA SEMICONDUCTOR UV OPTICAL SOURCES (SUVOS) PROGRAM

Improving diode-laser-induced fluorescence detection of airborne biological particles by exciting multiple biofluorophores [5416-21]
G. Wilson, R. DeFreez

Low-power ultraviolet lidar for standoff detection of BW agents [5416-22]
C. Prasad, W. Huang, J. Bufton, A. Achey, J. Dawson, R. Serino, W. Shi

SESSION 6
CHEMICAL AND BIOLOGICAL STANDOFF DETECTION TECHNOLOGIES I

Review of active chem-bio sensing [5416-23]
C. Swim

Heterodyne lidar for chemical sensing [5416-24]
SESSION 7
CHEMICAL AND BIOLOGICAL STANDOFF DETECTION TECHNOLOGIES II

Determination of bacterial aerosol spectral cross sections [5416-26]
A. Lazarevich, M. Thomas, D. Duncan, C. Mitchell

Systems engineering tradeoffs for a bio-aerosol lidar referee system [5416-27]

Estimating the backscatter spectral dependence and relative concentration for multiple aerosol materials from lidar data [5416-28]
R. Warren, R. Vanderbeek

Aerosol collection and analysis using diffuse reflectance infrared spectroscopy [5416-29]
A. Samuels, D. Wong, G. Meyer, G. Roelant, B. Williams, R. Miles, Jr., C. Manning

Handheld hyperspectral imager for standoff detection of chemical and biological aerosols [5416-30]
M. Hinnrichs, J. Jensen, G. McAnally

Multifrequency sounding with DF-laser-based lidar system: preliminary results [5416-32]
V. Agroskin, B. Bravy, Y. Chernyshev, V. Kirianov, E. Makarov, V. Papin, S. Sotnichenko, G. Vasiliev

POSTER SESSION

Remote atmospheric breakdown for standoff detection using intense short laser pulse compression [5416-36]
A. Ting, I. Alexeev, D. Gordon, E. Briscoe, J. Penano, R. Hubbard, P. Sprangle, G. Rubel

Volume 5417 Unattended/Unmanned Ground, Ocean, and Air Sensor Technologies and Applications VI

Chair/Editor: Edward M. Carapezza

Conference Committee

ACOUSTIC SENSORS I

Wideband DOA estimation algorithms for multiple target detection and tracking using unattended acoustic sensors [5417-3]
M. Azimi-Sadjadi, A. Pezeshki, L. Scharf, M. Hohil

Algorithms and performance of small baseline acoustic sensor arrays [5417-5]
B. Sadler, R. Kozick, S. Collier

TTCP AG-6: acoustic detection and tracking of UAVs [5417-6]
T. Pham, N. S sour

ACOUSTIC SENSORS II (PLATFORM)

Multicategory classification of ground vehicles based on their acoustic emissions [5417-7]
H. Wu, J. Mendel

Coherence analysis using canonical coordinate decomposition with applications to sparse processing and optimal array deployment [5417-8]
M. Azimi-Sadjadi, A. Pezeshki, R. Wade
SEISMIC, MAGNETIC, BIO, CHEM, AND OTHER UNATTENDED GROUND SENSORS

- **Triggering imagery with unattended seismic/magnetic sensing for vehicle classification** [5417-11]
  R. Knobler
- **A low-noise MEMS accelerometer for unattended ground sensor applications** [5417-12]
  K. Speller, D. Yu
- **Micro UV detector** [5417-14]
  J. Cabalo, R. Sickenberger, W. Underwood, D. Sickenberger
- **Optical magnetometer concepts** [5417-15]
  G. Wyntjes, D. Rall
- **Seismic signal and noise assessment for footstep detection range estimation in different environments** [5417-78]
  A. Pakhomov, T. Goldburt

UNATTENDED OCEAN SENSOR TECHNOLOGIES AND APPLICATIONS

- **A distributed evolutionary algorithmic approach to the coverage problem for submersible sensors** [5417-16]
  J. Tillett, R. Rao, F. Sahin
- **Counter-narcotic acoustic buoy (CNAB)** [5417-20]
  M. Bailey

ELECTRO-OPTICAL UGS SENSORS

- **A low-cost thermal imaging sensor for networked applications** [5417-22]
  P. Manning, N. Parkinson
- **Passive micro-optics sensors for 3D imaging** [5417-26]
  B. Javidi, Y. Frauel
- **Low-cost moderate-resolution spectrometer without grating** [5417-23]
  J. Bankman, E. Rogala, M. Thomas
- **Laser-induced optronic countermeasure against charge-coupled devices and optronic counter-countermeasure in the visible region and infrared region** [5417-25]
  N. Hueber, J. Moeglin, A. Dieterlen, A. Boffy

SPECIAL SESSION: UNMANNED AIR AND UNDERSEA VEHICLE TECHNOLOGIES AND RELATED UGS APPLICATIONS

- **Device for electro-magnetohydrodynamic (EMHD) energy harvesting** [5417-29]
  S. Snarski, R. Kasper, A. Bruno
- **Intelligent obstacle avoidance system for unmanned undersea vehicles in shallow water** [5417-30]
  K. Kim, A. Kostrzewski, D. Erwin
- **Designing avionics for terrestrial neutron environments** [5417-31]
  P. Coakley, D. Breuner, R. Milanowski, M. Rose, A. Magnus
- **Concurrent constraint programming-based path planning for uninhabited air vehicles** [5417-32]
  S. Gualandi, B. Tranchero
- **Employing a communication payload on an unmanned underwater vehicle (UUV) for harbor monitoring and homeland defense** [5417-33]
  J. Wells, T. Wurth, M. Manning
- **UAV team behaviors in operational scenarios** [5417-34]
  J. Gilmore, J. Garbarino
Situation awareness for UAV equipped with image/video understanding system based on network-symbolic models [5417-35]
G. Kuvich

A global positioning system (GPS) interference electronics support measure (ESM) payload system for unmanned aerial vehicles (UAVs) [5417-36]
T. Wurth, J. Wells

KEYNOTE PRESENTATION

Networking: technologies and challenges for network-centric operations [5417-38]
L. Stotts, J. Allen

SYSTEM ENABLING TECHNOLOGIES (FUSION, LOCATION, COMMUNICATIONS, VULNERABILITIES, TAGS, AND POWER) I

A modular architecture for wireless sensor network nodes [5417-39]
J. Davis, N. Berry

Field testing and evaluation of a solar-blind UV communication link for unattended ground sensors [5417-41]
G. Shaw, A. Siegel, J. Model, M. Nischan

A miniature disposable radio (MiDR) for unattended ground sensor systems (UGSS) and munitions [5417-42]
J. Wells, T. Wurth

Fractional-N synthesizer simplifies UHF sensor radio [5417-44]
L. Alaimo

Special encryption considerations for unattended ground sensor systems [5417-45]
A. Drummond

SCA compliant data radios for unattended ground sensor systems [5417-46]
R. Woodring, M. Dapper

Path loss and antenna gain considerations for unattended ground sensor (UGS) systems [5417-47]
T. Bruns

SYSTEM ENABLING TECHNOLOGIES (FUSION, LOCATION, COMMUNICATIONS, VULNERABILITIES, TAGS, AND POWER) II

Transmit-only data exfiltration: the Sensor Enabled Notification System (SENS) [5417-49]
S. McDermott, T. Vaneck

Efficient routing in dense UGSS and wireless munitions control systems [5417-50]
R. O'Connell

Monitoring of diffusion processes with PDE models in wireless sensor networks [5417-51]
L. Rossi, B. Krishnamachari, C. Kuo

Sensor localization using helicopter acoustic and GPS data [5417-52]
T. Damarla, V. Mirelli

UGS SYSTEM I

Architectural and operational tradeoffs in wireless sensor networks [5417-55]
J. Davis, N. Berry

Summary of phenomenology for operations in urban environments [5417-58]
J. Kile, J. Gould, W. Gnadt, D. Matthiesen, F. McIntyre, V. Ingle, M. Rossacci

Sensor-based base camp security [5417-79]
L. Peck, J. Lacombe
UGS SYSTEM II

Sense, decide, act, communicate (SDAC): next generation of smart sensor systems [5417-60]
N. Berry, J. Davis, T. Ko, R. Kyker, R. Pate, D. Stark, R. Stinnett, J. Baker, A. Cushner, C. Van Dyke, B. Kyckelhahn

Sensor deployment planning for unattended ground sensor networks [5417-62]
J. McKitterick

Networked sensors in support of the NATO TG-25 field test experiment [5417-65]
B. Peltzer, M. Hohil, E. Tsui

Terrain commander UGS operational trials [5417-66]
R. Steadman

3D heterogeneous sensor system on a chip for defense and security applications [5417-67]
S. Bhansali, G. Chapman, E. Friedman, Y. Ismail, P. Mukund, D. Tebbe, V. Jain

A modular low-energy wireless sensing and processing platform with an open software framework for unattended ground sensor applications [5417-69]
F. Newberg, D. McIntire, B. Schiffer, S. Valoff, W. Kaiser

Wireless sensor network applications and impacts in MOUT [5417-71]
J. Davis, N. Berry

UGS PROGRAMS AND USER PERSPECTIVES

Unattended ground sensor systems for special operations forces [5417-74]
P. Morgan

Volume 5418 Spaceborne Sensors

Chairs/Editors: Robert D. Habbit, Jr., Peter Tchoryk, Jr.

Conference Committee

Introduction

SESSION 1
SENSORS FOR ON-ORBIT GUIDANCE, INSPECTION, AND SITUATIONAL AWARENESS

Using science-driven technologies for the defense and security applications [5418-2]
S. Habib, D. Zukor, S. Ambrose

Advanced Video Guidance Sensor (AVGS) project summary [5418-3]
S. Van Winkle

The RF Probe: providing space situational awareness through broad-spectrum detection and characterization [5418-4]
R. Zenick, K. Kohlhepp, R. Partch

Machine vision applied to navigation of confined spaces [5418-5]
J. Briscoe, D. Broderick, R. Howard, E. Corder

Advanced Video Guidance Sensor and next-generation autonomous docking sensors [5418-6]
S. Granade

Advanced Video Guidance Sensor (AVGS) development testing [5418-7]
R. Howard, A. Johnston, T. Bryan, M. Book

Laser imaging sensor system for on-orbit space shuttle inspection [5418-8]
SESSION 2
RF AND LIDAR SYSTEMS

RELAVIS: the development of a 4D laser vision system for spacecraft rendezvous and docking operations [5418-22]
E. Martin, D. Maharaj, R. Richards, J. Tripp, J. Bolger, D. King

SESSION 3
VISIBLE AND NEAR-IR WAVELENGTH SENSORS

LAPS: the development of a scanning lidar system with GNC for autonomous hazard avoidance and precision landing [5418-23]
J. de Lafontaine, A. Ulitsky, J. Tripp, R. Richards, M. Daly, C. Sallabarger
RocketCam systems for providing situational awareness on rockets, spacecraft, and other remote platforms [5418-13]
R. Ridenoure

SESSION 4
IR SYSTEMS

Design and technical demonstration of a spectral dispersive module for an IR hyperspectral instrument for Earth monitoring from geo-synchronous Earth orbit [5418-16]
E. Harvey, J. Giroux, M. Chamberland, P. Lagueux, M. Dumais, M. Maszkiewicz

SESSION 5
NEW TECHNOLOGIES

Long-range phase-conjugate interferometry [5418-19]
R. Kurtz, R. Pradhan, T. Aye, G. Savant, T. Jannson, M. Klein
Image quality analysis of a spectra-radiometric sparse-aperture model [5418-20]
N. Block, R. Introne, J. Schott
Photothermoplastic films as recorders in observation systems of zonal structures [5418-21]

POSTER SESSION

Design of a novel star tracker optical system [5418-12]
X. Liu, X. Cai, C. Flueraru, S. Chang, C. Grover
SESSION 1
SEARCH AND TARGET: ACQUISITION ISSUES

Conspicuity and identifiability: efficient calibration tools for synthetic imagery [5431-1]
A. Toet, M. Hogervorst, P. Bijl

Using simulation to determine the signature data distribution of a given CASTFOREM scenario [5431-2]
T. Gonda, E. Polsen, J. Jones, L. Dowd, D. Holm, R. Wheeler

Theoretical modeling of a detection system based on optical coherence contrast [5431-4]
R. Coutinho, D. Selviah, H. Griffiths

Exploring model-based target discrimination metrics [5431-5]
G. Witus, M. Weathersby

New user interface and features of the SR 5000: revival of infrared CVF-based spectroradiometry [5431-7]
D. Cabib, A. Gil, R. Buckwald

Lattices modeling as support for multigrid and multirate processing of two-dimensional signals [5431-8]
M. Almeida

SESSION 2
SEARCH AND TARGET: ACQUISITION TOOLS

Ship exhaust gas plume cooling [5431-9]
H. Schleijpen, F. Neele

Detonation discrimination techniques using a near-infrared focal plane array camera [5431-10]
A. Dills, G. Perram, S. Gustafson

A GIS-based simulation architecture and prototype for realistic spectral scene generation of vegetated areas [5431-11]
C. Fink, J. Moulton, Jr., M. Ortalano, J. Helmsen, A. Soiguine, R. Kaplan, W. Seng, R. Haren

Intruder detection and tracking using UWB technology [5431-12]
G. Schiavone, P. Wahid, R. Palaniappan, J. Tracy, E. Vandoorn, P. Micikevicius, C. Hughes

High temporal and spatial thermal infrared characterization of dense grass during high-humidity conditions [5431-37]
J. Ballard, Jr., T. Berry, D. Leese, S. Anderson, L. Bunch

Target recognition and scene interpretation in image/video understanding systems based on network-symbolic models [5431-15]
G. Kuvich

Unattended acoustic sensor simulation of TG25 trials using CHORALE workshop [5431-17]
P. Gozard, A. Le Goff, P. Naz, T. Cathala, J. Latger, Y. Dupuy

A computational approach for evaluating the probability of acoustic detection of a military vehicle [5431-18]
S. Hong, N. Vlahopoulos, R. Mantey, D. Gorsich
SESSION 3
JOINT SESSION WITH CONFERENCE 5408

Simulation of atmospheric-turbulence image distortion and scintillation effects impacting short-wave infrared (SWIR) active imaging systems [5431-20]
D. Tofsted, S. O’Brien

RenderView: physics-based rendering of ground vehicles [5431-21]
D. Talcott, D. Thomas, W. Reynolds, R. Evans, L. Miller

SESSION 4
BRDF ISSUES

Bidirectional reflectance measurements for high-resolution signature modeling [5431-22]
J. Jafolla, W. Reynolds

Reflection properties of vegetation and soil with a new BRDF database [5431-23]
M. von Schoenermark, H. Roeser

Frequency space techniques for BRDF shading [5431-24]
R. Scoggin, R. Machiraju

Models for scattering of light from rough surfaces with applications in IR signature simulations [5431-26]
P. Hermansson

Hemispherical scatter instrument for reflectance function measurement based on the discrete-ordinates method [5431-27]
M. Sánchez, W. Sutton, C. Borras

SESSION 5
TARGET AND BACKGROUND REPRESENTATION

Outdoor surface temperature measurement: ground truth or lie? [5431-28]
T. Skauli

Toward a high-temporal-frequency grass canopy thermal IR model for background signatures [5431-29]
J. Ballard, Jr., J. Smith, G. Koenig

Incorporation of measured natural reflectivities in a background clutter simulation [5431-31]
A. Sheffer, Jr., J. Cathcart, S. Hahn, S. Harbert

SESSION 6
MARITIME BACKGROUNDS

A statistical sea-surface clutter model in the long-wave infrared [5431-32]
M. Bernhardt, M. Smith, P. Whitehead, L. Hunt, D. Hickman, C. Dent

Incorporation of sea-surface clutter in infrared scenes for antiship cruise missile models [5431-33]
D. Fraedrich, C. Cahill, R. Gover, C. Miller, P. Shaw, T. Taczk

CAMEO-SIM: an ocean model extension to the physically accurate broadband EO scene generation system for the assessment of target vehicles within their natural environments [5431-34]
A. Kirk, M. Cowan, R. Allen

POSTER SESSION

Study on the electromagnetic scattering interaction between a conducting plate and 1D random rough surface [5431-39]
Y. Wang, L. Guo
Volume 5432 Polarization: Measurement, Analysis, and Remote Sensing VI

Chairs/Editors: Dennis H. Goldstein, David B. Chenault

Conference Committee

Introduction

SESSION 1
ANALYSIS, ALGORITHMS, AND MODELING I

Stokes vector component versus elementary factor performance in a target detection algorithm [5432-1]
F. Crosby

Polarization-encoded discriminators for secured fingerprint verification systems [5432-2]
A. El-Saba

Stokes vector correlations and material discrimination from speckle fields [5432-3]
J. Ellis, A. Dogariu

Scattering and emission polarization simulation for simple objects [5432-4]
C. An, K. Zeringue

Factors controlling discrimination in imaging polarimetry [5432-5]
M. Duggin

SESSION 2
ANALYSIS, ALGORITHMS, AND MODELING II

Spectropolarimetric properties of vegetation [5432-6]
D. Goldstein, J. Cox

Comparison between polarization measurements and model calculations of cenosphere surfaces, with different depolarization properties and different coverage [5432-7]
G. Forssell

The impact of clutter variance on feature discrimination in imaging polarimetry [5432-8]
M. Duggin, E. Cabot

Factors controlling the manual and automated extraction of image information using imaging polarimetry [5432-9]
M. Duggin

SESSION 3
INSTRUMENTATION AND REMOTE SENSING I

Atmospheric correction of HyperSpecTIR measurements using the research scanning polarimeter [5432-10]
B. Cairns, J. Laveigne, A. Rael, R. Granneman

Portable polarimetric underwater imaging system with a linear response [5432-11]
N. Karpel, Y. Schechner

Spectral polarization signature analysis and modeling in the infrared for the detection of landmines [5432-12]
R. Bock, J. Cathcart

Lenslet-array-based Stokes vector imagery [5432-13]
M. Abushagur, A. El-Saba
SESSION 4
INSTRUMENTATION AND REMOTE SENSING II

**Multispectral polarimetric imaging with coherent illumination: towards higher image contrast [5432-14]**
M. Alouini, F. Goudail, P. Réfrégier, A. Grisard, E. Lallier, D. Dolfi

**Handheld polarimeter for phenomenology studies [5432-15]**
D. Chenault, A. Lompado, E. Cabot, M. Fetrow

**Nonscanning computed tomography imaging spectropolarimeter (NS-CTISP): design and calibration [5432-16]**
B. Miles, B. Kim

**Methods and applications of snapshot spectropolarimetry [5432-17]**
N. Hagen, A. Locke, D. Sabatke, E. Dereniak, D. Sass

POSTER SESSION

**Significant science projects with simple sources using an optical interferometer and polarimeter [5432-18]**
N. Elias II