

**Technical Program
2011 Beam Control
Conference**



**23 - 26 May 2011
Orlando, Florida**

SECURITY NOTE:

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- A - information is open, public release
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Thanks to Our Exhibitors

Cobham

COBHAM

High Energy Laser
Joint Technology Office



L-3 IOS



communications

Brashear

MONDAY

SHORT COURSES

- 0700 Registration at Shades of Green Resort
- 0800 Short Courses Begin
 - Beam Control System of the Airborne Laser Test Bed (Limited)
Magnolia Room North
Kenneth Billman, Lockheed Martin
 - Introduction to Beam Control (FULL DAY)
Magnolia Room West
Paul Merritt, University of New Mexico
- 1200 Break for Lunch
- 1300 Short Courses Begin/Resume
 - WaveProp Tutorial
Magnolia Room North
Terry Brennan, the Optical Sciences Company
- 1700 Short Courses Adjourn

TUESDAY MORNING

0630 Registration at Resort, Magnolia Foyer

Keynote Breakfast

Magnolia Rooms North & East

0700 Breakfast

0720 Call to Order and Opening Comments

Dr Richard Carreras, Conference Chair

0725 Speaker Introduction

Dr Dan Herrick, JTO BC TAWG & AF Lead

0730 Keynote Address: A Brief History and the Lessons Learned from Air Force Beam Control

Dr Paul Merritt, University of New Mexico

Atmospherics

Magnolia Room South

Chair: *Michail Voronstov, University of Dayton*

0815 Estimation of r_0 , Greenwood Frequency, and Turbulence Inner Scale from Shack Hartmann WaveFront Sensor

Measurements - A

Terry Brennan, the Optical Sciences Company

0845 An Experimental Study of the Probability Density Function of a Turbulence Induced Fluctuating Laser Beam - A

Joe Watkins, U.S. Naval Academy

0915 Real-Time Atmospheric Turbulence Measurements Using the Three Aperture Scintillometer System (TASS) - A

John Stryjweski, CSC

0945 Branch Point Mitigation of Thermal Blooming Phase Compensation Instability - C

Mark Spencer, Air Force Institute of Technology

1015 Break

1045 Turbulence Profiling for Tactical Relay Mirror (TRMS) Test Predictions - D

Matthew Whiteley, MZA Associates

1200 Lunch

TUESDAY MORNING

0630 Registration at Resort, Magnolia Foyer

Keynote Breakfast

See Page 3

DE Systems

Magnolia Room West

Chair: *Dan Herrick, Air Force Research Laboratory*

0815 Beam Alignment Diagnostic for the Navy's "Laser Weapon System" (LaWS) Incoherent Beam Combining - C

Peter Kazunas, Penn State Electro-Optics Ctr

0845 Navy LaWS Beam Control - Results, Plans and Technology - D

Robert Pawlak, Naval Surface Warfare Center/DD

0915 Beam Control Integrated Demonstration: Field Test Results - C

Aaron Buckner, Northrop Grumman Aerospace Systems

0945 Assembly, Integration and Test of the Beam Control Subsystem for the US Army High Energy Laser Technology Demonstrator - C

Edward Montgomery, US Army Space and Missile Defense Command/ARSTRAT

1015 Break

DE Components

Magnolia Room West

Chair: *J. Thomas Schriempf, NAVSEA*

1045 Optical Performance of a Compact Off-Axis Beam Director for HEL Applications - C

Allan Wirth, Northrop Grumman AOA Xinetics

1115 High-Power Surface Parallel Actuator Mirrors - C

Thomas Price, Northrop Grumman AOA-Xinetics

1200 Lunch

TUESDAY AFTERNOON

DE Components (continued)

Magnolia Room West

Chair: *J. Thomas Schriempf*, NAVSEA

- 1300 **Anamorphic Deformable Mirror for Solid State Laser Correction - C**
Allan Wirth, Northrop Grumman AOA Xinetics
- 1330 **ALTB BCFC High Performance Optics - D**
William Hughes, Lockheed Martin
- Chair: *Edward Montgomery*
- 1400 **SMDC Light Weight Beam Director - D**
Chris Johnston, Science Applications International Corporation
- 1430 **Compact High-Performance Fiber Optic Gyro Technologies for Directed Energy Applications - D**
William Dickson, SA Photonics
- 1500 **A LOCI IMAGE Testbed Progress Update - A**
Paul Mcmanamon, LOCI
- 1600 **Outdoor Reception at Resort**

TUESDAY AFTERNOON

Phased Array Beam Control

Magnolia Room South

Chair: *Larry Huntley*, Air Force Research Laboratory

- 1300 **Phased Array Fire Control Functions - D**
Dan Marker, Air Force Research Laboratory/RDS
- 1330 **Tactical Airborne Applications for Phased Fiber Laser Arrays - D**
Doug Rigdon, AEGIS Technologies Group
- 1400 **HEL Phased Array Architectures for Beam Control and ATP - C**
Kevin Probst, The CORE Group, Inc.
- 1430 **Coherent Beam Combining Over 7 km Atmospheric Propagation Path: Experimental Results and Path Forward - D**
Mikhail Vorontsov, University of Dayton
- 1500 **Holographic Beam Control - C**
A Hutchin, Optical Physics Company
- 1600 **Outdoor Reception at Resort**

WEDNESDAY MORNING

0630 **Registration at Resort, Magnolia Foyer**

Keynote Breakfast

Magnolia Rooms North & East

- 0700 **Breakfast**
- 0720 **Call to Order and Opening Comments**
Dr Richard Carreras, Conference Chair
- 0725 **Speaker Introduction**
Dr J. Thomas Schriempf, JTO BC TAWG & Navy Lead
- 0730 **Keynote Address: Beam Control Trades for Near-Term Navy Tactical Laser Concepts**
Dr John Albertine, Consultant

Target Based Sensing to Coherently Combine Transmitted Beams I

Magnolia Room South

Chair: *Dan Marker*, Air Force Research Laboratory

- 0815 **Coherent Beam Combining - C**
Troy Rhoadarmer, Science Applications International Corporation
- 0845 **Investigation of Target Phasing in the Presence of Speckle for the Interferometric Phased Array Laser System (IPALS) Concept - D**
Wesley Green, Air Force Research Laboratory/RDS
- 0915 **Fundamental Measurement Limitations in Target Based Phased Array Applications - A**
Glenn Tyler, the Optical Sciences Company
- 0945 **Analysis and Simulation Results for Phased Array Concepts - C**
David Mann, the Optical Sciences Company
- 1015 **Break**
- 1045 **Speckle Metrics Based Beam Control in Tiled Fiber-Array Systems for HEL Operation with Extended (Speckle) Targets - A**
Mikhail Vorontsov, University of Dayton
- 1115 **Multi-Aperture Phase Synthesis (MAPS) and Application to Directed Energy Phased Arrays - C**
JV Rudd, Lockheed Martin AOA-Xinetics
- 1145 **Lunch**

WEDNESDAY MORNING

0630 Registration at Resort, Magnolia Foyer

Keynote Breakfast

See Page 6

Adaptive Optics

Magnolia Room West

Chair: *Patrick Kelly*, Air Force Research Laboratory

0815 **Multi-Conjugate Adaptive Optics (MCAO)**

Project: Compensation in Strong

Scintillation - C

Julie Smith, Air Force Research Laboratory

0835 **The Aggregate Behavior of Branch Points**

- Precursor Phase - D

Denis Oesch, Science Applications

International Corporation

0855 **DynamO: A Control Scheme for Improving**

AO Performance in the Presence of Fast

Moving Wavefronts - D

Darryl Sanchez, Air Force Research

Laboratory/RDS

0915 **A Programmatic Overview of ATEC's Feed**

Forward Control Effort - D

Patrick Kelly, Air Force Research

Laboratory/RDS

0935 **Break**

Classified Session

On-site Location

0950 **ALTB BCFC Wavefront Control**

1020 **ALTB BCFC Acquisition, Tracking, Pointing
and Jitter Compensation**

1050 **ALTB BCFC Lessons Learned**

1120 **Simulation Comparison of Track
Illumination Schemes for the Electric
Laser on a Large Aircraft**

1150 **Lunch**

WEDNESDAY AFTERNOON

Aero Optics

Magnolia Room West

Chair: *D.J. Wittich*, Air Force Research Laboratory

1300 **Airborne Aero-Optics Laboratory (AAOL)**

Flight Test Capabilities-Other Possibilities-A

Michael Zenk, Notre Dame

1330 **Predictive Adaptive Optics Control for Non-**

Uniformly Advecting Aero-Optic

Flow Fields - C

Lawton Lee, Lockheed Martin

1400 **Airborne Aero-Optics Laboratory Wind-**

Tunnel and Flight-Test Experiments - C

D. J. Wittich, Air Force Research

Laboratory/RD

1430 **Far-Field Laser Intensity Drop-Outs Caused**

by Turbulent Boundary Layers - A

Stanislav Gordeyev, University of Notre Dame

1500 **Aero-Optical and Aero-Mechanical**

Characterization of Installed Turret

Designs using a CFD-based Methodology - C

William Coirier, Kratos/Digital Fusion Inc.

WEDNESDAY AFTERNOON

Target Based Phase Sensing to Coherently Combine Transmitted Beams II

Magnolia Room South

Chair: *Wesley Green*, Air Force Research Laboratory

1300 **Rough Surface Scattering as Applied to**

Laser Target Interaction of a Multi-Fiber

Laser Source - C

Mark Spencer, Air Force Institute of

Technology

1330 **An All-Electronic Alternative to Fast**

Steering Mirrors for Beam Control - C

Terry Dorschner, Raytheon Company

1400 **Sub-Aperture Power Scaling for Fiber**

Phased Arrays - C

Thomas Alley, Lockheed Martin

Coherent Technologies

1430 **A Modern Control Theory Approach to**

Coherent Combining - C

Scott Harris, Flatiron Research, LLC

THURSDAY MORNING

0630 Registration at Resort, Magnolia Foyer

Keynote Breakfast

Magnolia Rooms North & East

0700 Breakfast

0720 Call to Order and Opening Comments

Dr Richard Carreras, Conference Chair

0725 Speaker Introduction

Mr Chuck LaMar, JTO BC TAWG & Army Lead

0730 Keynote Address: Standards for DE
Parameters and Interfaces - A

Dr Louis Marquet, Marquet Consulting

Phased Array Components

Magnolia Room South

Chair: *Larry Huntley*, Air Force Research Laboratory

0815 GPU Processor for High-Bandwidth
Compensated Phased Array Imaging - D

Matthew Whiteley, MZA Associates

0845 Risley Integrated Steering Module (RISM) for
DARPA Phased Array Steering Transceiver
Program (PHAST) - C

D.J. Adams, Lockheed Martin

0915 Preliminary Evaluation of Fuselage
Conformal Aero-Optics

Matt Whiteley, MZA Associates Corporation

0945 A High-speed, High-power, Transmission-
Mode Adaptive Optic - C

Andy McKie, Raytheon Company

1115 Poster Session

1100 Lunch

THURSDAY MORNING

0630 Registration at Resort, Magnolia Foyer

Keynote Breakfast

See page 9

DE Systems II

Magnolia Room West

Chair: *Bob Pawlak*, Naval Surface Warfare Center

0815 Tactical Beam Control for a Small
Aircraft - D

Patrick Saunders, Air Force Research
Laboratory

0845 Simulations of a Hybrid Active-
Segmentation and Fitts Correlator
Tracker - D

Joseph Riley, MZA Associates Corporation

0915 Beam Control Systems Study

Paul Berger, MIT, Lincoln Laboratory

Pointing and Tracking

Magnolia Room West

Chair: *Dan Herrick*, Air Force Research Laboratory

0945 Evaluation of Image-based Tracking
Techniques for High Energy Laser Aim
Point Maintenance - C

David Goldberg, Equinox Corporation

1015 A Plug-and-Play Controller for Jitter
Control in Pointing and Tracking - C

Yun Wang, Tempest Technologies

1045 Root-Causing Vibration-Induced Jitter in
the APT at WSMR - A

Gabriella Cerrato, Sound Answers Inc.

1115 Poster Session

1100 Lunch

Conference Organizers

Conference Chair

Rich Carreras

Conference Co-Chairs

Darryl Sanchez

Chris Washer

Committee Members

Sandy Montgomery

Al Ogloza

Conference Coordinator

Cynnamon Spain

Security Coordination

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Renee Cousins

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