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Introduction

This year's conference, held in Berlin Germany, was well attended with many excellent papers in all fields of technology related to Optical Countermeasures. The welcome, introductions, and administrative notes for the conference were given by Conference Chairmen David Titterton and Robert Grasso.

The first keynote session started the conference with two excellent papers, the first one by Dr. Hans Dieter Tholl of Diehl Defence, and the second one given by Prof. Ted Masselink of Humboldt University. Hans reviewed the advances in countermeasure technology for platform protection over the last 15 years. Potential future developments were considered with an emphasis on multi-functionality. Ted spoke about the evolution of semiconductor laser technology and in particular how quantum-cascade-technology performance can be enhanced, with some interesting predictions of performance, especially beam brightness.

The second keynote session also featured two papers, the first one from Dr. Richard Maulini of Alpes Lasers and the second one from Stuart Chapman of Leonardo. Richard described the current developments aimed at making quantum-cascade lasers more robust for anticipated future countermeasure applications. Stuart described the Miysis directed infrared countermeasure system and reported on the excellent platform-protection performance achieved during recent live-fire tests.

The third keynote session feature a paper by Paul Winstanley of The TecHorizons Institute. He described approached to innovation through both past and present projects. He emphasised the importance of multi-disciplinary approaches to achieve the desired goals when adapting existing technology to meet enhanced project requirements rapidly and efficiently.

Session 3, Lasers and Sources I, saw three papers presented. The first paper was an invited paper from Dr. Frank Wise of Cornell University describing a new route to generating high power from fibre lasers using spatio-temporal mode-locking. This was followed by two more excellent papers, the first from the team at ONERA (Pierre Bourdon), describing a passively Q-switched micro-laser and a second paper delivered my Markus Niemeyer detailing the developments with advanced, high efficiency, high-power diode lasers.

Session 4, Lasers and Sources II, consisted of two very good papers, the first by Dr. Eric Park, describing advances with target illumination lasers, the second paper from a team at Herriot-Watt (Dr. Daniel Esser) describing pump sources for holmium YAG amplifiers.

Session 5, Atmospheric Effects, was introduced by an invited paper from Jeremy Bos, of The Michigan Technological University, describing mitigation of atmospheric effects in the presence of extreme anisoplanatic geometry. The supporting paper was from a team at Heriot-Watt University and reported a mathematical-modelling technique for compensating atmospheric-turbulence-induced aberration effects.

Session 6, was the third key-note session concerning innovation, Paul Winstanley.

Session 7, Laser Effects I, saw two excellent papers concerning use of laser-induced dazzle effects from the team at The Royal Military Academy Belgium. This session was introduced by an invited paper delivered by Dr. Marijke Vanderwal describing the impact of laser-induced dazzle on personnel undertaking various tasks. Dr. Gareth Lewis described the impact of low-power laser beams causing damage to an uncooled thermal imager, through an in-band mechanism.

Session 8, Threat Detection and Imaging, was started with two invited papers. The first from Itor James, described the calibration of ultraviolet signature prediction methods versus empirical data for threat simulation models. The second, from Dr. David Denton, reviewed the various approaches to non-mechanical beam steering and the development of a new technique for beam control. There were two excellent supporting papers in this session from teams in The Republic of Korea, the first concerned used of ladar data for Dr.one detection and the second paper described the use of digital magnetic compass to ensure robust target location data from a ladar system.

Session 9, Quantum-Cascade Lasers (QCL), had two invited papers and a supporting paper. The first invited paper was from Dr. Arkadiy Lyakh, who described an approach for optimising the laser emission (enhanced brightness) from a broad-area QCL for countermeasure applications. The second invited paper, from Frances BoDr.ucki considered aliasing effects from a QCL and compensation from anti-aliasing algorithms.

Session 10, Threats, Threat Detection and Discrimination, had an excellent invited paper from Germany given by Prof.essor Marc Eichhorn, which described the use of laser beams in optical countermeasures, from generation of the coherent radiation to impact on the threat weapon. There were two supporting papers, the first one from China describing a laser interception technique using a heterodyne self-mixing technique. The second supporting paper was from Dr. Ziya Figen, who reported on a mid-wave infrared laser developed for countermeasure field tests.

Session 11, Laser Effects II, had four excellent contributing papers all concerning in-band dazzle effects. The first paper was from Dr. Bernd Eberle, who described an approach for mitigating the impact of laser-induced on imaging sensors. Dr. Tugba Ozbilgin reported on an analysis of laser-dazzle effects, whilst Cristiane

Nascimento described measurements made of dazzled CCD and CMOS cameras using visible and near infrared radiation. Chris Westlake concluded the session, and the conference sessions, by describing his work on modelling laser-induced damage thresholds compared with experimental data collected from 2D arrays.

The conference again provided a forum to debate an important topic. This year's topic was *Hostile Fire and Unguided Threat: do we really have an issue here?* As usual, there was a lively debate. It was established quickly that there is 'an issue' here, as these weapon posed a serious risk to the survivability of air platforms. Various strategies and techniques were discussed for countering these asymmetric threats. The use of laser-based countermeasures was discussed in some detail, but there was some confusion regarding the actual restriction defined in the International Committee of the Red Cross (ICRC) Vienna Protocol (October 1995).

We hope to establish a plenary session during next year's event with a number of other conferences at this symposium, which considers countering swarms of unmanned air vehicles.

Overall the Chairmen were very pleased with the quality of the papers, attendance, detailed treatment of the subjects and the quality of the questions when the papers were opened for discussion. At the conclusion of this conference the Chairmen thanked the Programme Committee for their effort over the year to secure good papers, thanked the presenters for their excellent work and encouraged them to join us at next year's conference, and wished everyone safe travels with the hopes of seeing everyone next year at the conference in Strasburg.

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