

Conference 7115

SESSION 6

Room: D106. Tues. 14.00 to 15.40

Non-Linear Materials for OCM

Session Chair: Hans Dieter Tholl, Diehl BGT Defence GmbH & Co. KG (Germany)

14.00: **Review of the development of nonlinear materials for mid-IR generation**, Paul D. Mason, QinetiQ Ltd. (United Kingdom) [7115-22]

14.20: **Tandem PPKTP and ZGP OPO for mid-infrared generation**, Markus Henriksson, Swedish Defence Research Agency (Sweden) and Kungliga Tekniska Högskolan (Sweden); Lars J. Sjöqvist, Swedish Defence Research Agency (Sweden); Gustav Strömqvist, Valdas Pasiskevicius, Fredrik Laurell, Kungliga Tekniska Högskolan (Sweden) [7115-23]

14.40: **Synchronous initiation of optical detonators by Q-switched solid laser sources**, Jerome Goujon, Olivier Musset, Univ. de Bourgogne (France); Alain Marchand, Christophe Bigot, TDA Armements S.A.S. (France) . . [7115-24]

15.00: **Tunable high-pulse-energy mid-infrared laser source based on optical parametric amplification in ZnGeP₂**, Magnus W. Haakestad, Norwegian Defense Research Establishment (Norway); Gunnar Arisholm, Espen Lippert, Stephane Nicolas, Gunnar Rustad, Knut Stenersen, Norwegian Defence Research Establishment (Norway) [7115-25]

15.20: **Solid state visible Raman laser**, Ian Elder, SELEX Sensors and Airborne Systems Ltd. (United Kingdom) [7115-26]

Coffee Break. 15.50 to 16.10

SESSION 7

Room: D106. Tues. 16.10 to 17.20

Analysis and Simulation

Session Chair: David H. Titterton, Defence Science and Technology Lab. (United Kingdom)

16.10: **Countermeasure development using a formalised, metric-based process (Invited Paper)**, Laurence Barker, Defence Science and Technology Lab. (United Kingdom) [7115-27]

16.40: **Use of a transmissometer model for infrared smoke model validation and assessment of obscuration and detection times**, Brian Butters, Roy H. Walmsley, Chemring Countermeasures (United Kingdom) [7115-28]

17.00: **CW and temporal theoretical model predictions and experimental results for Tm:YAG and Ho:YAG lasers**, Eric K. Gorton, John G. Betterton, David A. Orchard, Brian J. Perrett, Paul D. Mason, QinetiQ Ltd. (United Kingdom) [7115-31]

Room: D106. Tues. 17.10 to 17.15

Closing Remarks

David H. Titterton, Defence Science and Technology Lab. (United Kingdom)

Tandem PPKTP and ZGP OPO for mid-infrared generation

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Efficient laser sources in the 3 - 5 μm wavelength range are needed for directed infrared countermeasures, but also have applications in remote-sensing, medicine and spectroscopy. We will present new results on our tandem optical parametric oscillator (OPO) scheme for converting the radiation from a 1.06 μm Nd³⁺-laser to the mid-infrared. Multi Watt level output power in the 3-5 μm range at 10 kHz pulse repetition frequency is reported. Our setup uses a type I quasi phase-matched PPKTP crystal in a near degenerate OPO to generate 2.13 μm radiation. A volume Bragg grating resonant close to, but not exactly at the degenerate wavelength, is used as a cavity mirror to reduce the bandwidth and ensure singly resonant operation. Both signal and idler from the PPKTP OPO are used to pump a ZGP OPO generating high power radiation in the 3-5 μm region. Using this scheme for each pump photon it is ideally possible to generate four photons all in the interesting wavelength range, thus enabling high efficiency conversion.