

# **24th European Frequency and Time Forum 2010**

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## Monday, 12 April 2010

17:30 - 19:00 Pre-registration

18:00 - 19:00 Welcome Drink

## Tuesday, 13 April 2010

09:00 Welcome and Introduction

09:15 Invited Plenary Presentation

Present and future impact of GNSS spaceborne scientific applications, in particular on orbit and gravity field determination

*Beutler, Gerhard<sup>1</sup>; Hugentobler, Urs<sup>2</sup>; Jaeggi, Adrian<sup>1</sup>;*

10:00 Overview of Time and Frequency Applications in ESA Missions  
ESA

10:40 Coffee break

### Session 1 - Materials and Resonators

11:20 [New Investigations on the LGT Crystal Intended for Frequency and Time Applications](#)

*Boy, Jean-Jacques<sup>1</sup>; Nguyen Thi Kim, Ngan<sup>2</sup>; Devautour-Vinot, Sabine<sup>3</sup>; Frayret,*

*Jérôme<sup>4</sup>*

12:00 [Analyzes of Very High Q Quartz Crystal Aimed to High Quality 5 MHz Resonators Achievement](#)

*Imbaud, Joël<sup>1</sup>; Boy, Jean Jacques<sup>1</sup>; Picchedda, Delphine<sup>2</sup>; Cibiel, Gilles<sup>3</sup>; Sthal,*

*Fabrice<sup>1</sup>*

12:20 [Investigation in compact optoelectronic oscillator with mini-disk resonator](#)

*Salzenstein, Patrice<sup>1</sup>; Volyanskiy, Kirill<sup>2</sup>; Pogumerskiy, Maxim<sup>3</sup>; Tavernier, Hervé<sup>1</sup>;*



*Rubiola, Enrico<sup>1</sup>; Larger, Laurent<sup>1</sup>*

12:40 [Oscillator Phase Noise Optimization and Correction](#)

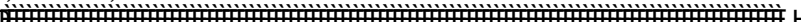

*Goryachev, Maxim ; Galliou, Serge ; Abbe, Philippe*

*FEMTO-ST Institute (FRANCE)*

## Session 2 - Cold Atom Clocks

- 12:00 [Recent Improvements and Current Uncertainty Budget of PTB Fountain Clock CSF2](#)  
*Gerginov, Vladislav ; Nemitz, Nils ; Griebisch, Dieter ; Kazda, Michael ; Wynands, Robert ; Weyers, Stefan* 
- 12:20 [Characterization of the Distributed Cavity Phase Shift in FO2 for Improving the Accuracy of SYRTE Fountain Clocks](#)  
*Guéna, Jocelyne<sup>1</sup>; Abgrall, Michel<sup>1</sup>; Rovera, Daniele<sup>1</sup>; Rosenbusch, Peter<sup>1</sup>; Santarelli, Giorgio<sup>1</sup>; Tobar, Michael E.<sup>2</sup>; Laurent, Philippe<sup>1</sup>; Gibble, Kurt<sup>3</sup>; Bize, Sébastien<sup>1</sup>; Clairon, André<sup>1</sup>* 
- 13:00 *Lunch break*

## Session 3 - GNSS Timing I

- 14:40 [Clock Strategy Experimentation with GIOVE Clocks](#)  
*Gonzalez, Francisco<sup>1</sup>; Cernigliaro, Alice<sup>2</sup>; Patrizia, Tavella<sup>2</sup>*  
<sup>1</sup>ESA (NETHERLANDS); <sup>2</sup>INRIM (ITALY)  H
- 15:00 [GGTO and UTC Dissemination results in the GIOVE-Mission](#)  
*Galluzzo, Geatano<sup>1,2</sup>; Mudrak, Alexander<sup>3</sup>; ; Binda, Stefano<sup>3</sup>; Radice, Gianmarco<sup>2</sup>*  
<sup>1</sup>VEGA-SELEX Systems Integration Plc, <sup>2</sup>Department of Aerospace Engineering,  
<sup>3</sup>European Space Agency/ ESTEC, Galileo Project Office  F

## Session 4 - Optical Clocks

- 14:20 [New Nonlinear and Multipole Effects on Optical Lattice Clock](#)  
*Palchikov, Vitaly<sup>1</sup>; Marmo, Sergey<sup>2</sup>; Ovsiannikov, Vitaly<sup>2</sup>; Taichenachev, Aleksey<sup>3</sup>;  
Yudin, Valery<sup>3</sup>; Katori, Hidetochi<sup>4</sup>; Takamoto, M.* J
- 14:40 [Towards an optical lattice clock based on mercury: loading of a dipole trap](#)  
*Mejri, Sinda ; Yi, Lin ; McFerran, John J. ; Bize, Sébastien  
SYRTE, Observatoire de Paris (FRANCE)* i
- 15:40 *Coffee break*

## Session 5 - Resonant Sensors

- 16:50 [High-Speed High Dynamic Range Resonant SAW Torque Sensor for Kinetic Energy Recovery System](#)  
*Kalinin, Victor ; Lohr, Raymond ; Leigh, Arthur ; Beckley, John ; Bown, George  
Transense Technologies plc (UNITED KINGDOM)* I
- 17:10 [BAW Pressure Sensor on LiNbO3 Membrane Lapping](#)  
*Baron, Thomas<sup>1</sup>; Masson, Jeremie<sup>2</sup>; Romand, Jean Pierre<sup>1</sup>; Alzuaga, Sebastien  
Catherinot, Lise<sup>3</sup>; Chatras, Matthieu<sup>3</sup>; Ballandras, Sylvain* €
- 17:30 [A High Sensitivity Open Loop Electronics for Gravimetric Acoustic Wave-Based Sensors](#)  
*Rabus, David ; Martin, Gilles ; Carry, Emile ; Blondeau-Patissier, Virginie; Ballandras,  
Sylvain FEMTO-ST Besançon (FRANCE)* F€
- 17:50 [Topology Dependence of Mass Sensitivities in Mode Localized Sensors](#)  
*Thiruvengatanathan, Pradyumna ; Yan, Jize ; Seshia, Ashwin  
University of Cambridge (UNITED KINGDOM)* FI

## Session 6 - T&F Transfer through Optical Fibers

- 16:10 [Multiplexed Optical Link for Ultra-Stable Frequency Dissemination](#)  
*Amy-Klein, Anne<sup>1</sup>; Lopez, Olivier<sup>2</sup>; Jiang, Haifeng<sup>3</sup>; Chanteau, Bruno Roncin, Vincent<sup>2</sup>  
Haboucha, Adil* G
- 16:50 [Fiber Based One Way Time Transfer with Enhanced Accuracy](#)  
*Ebenhag, Sven-Christian ; Hedekvist, Per Olof  
SP Technical Research Institute of Sweden (SWEDEN)* FG
- 17:10 [Time Transfer Through Optical Fibers: Progress on Calibrated Clock Comparisons](#)  
*Rost, Michael<sup>1</sup>; Fujieda, Miho<sup>2</sup>; Piester, Dirk<sup>1</sup>  
<sup>1</sup>Physikalisch-Technische Bundesanstalt, Braunschweig (GERMANY)* í Î
- 17:50 [Time Transfer Using Fiber Links](#)  
*Smotlacha, Vladimir<sup>1</sup>; Kuna, Alexander<sup>2</sup>; Mache, Werner<sup>3</sup>  
<sup>1</sup>CESNET (CZECH REPUBLIC)* í I

Wednesday, 14 April 2010

**Session 7 - Space-based T&F Transfer**

- 09:00 [Development of the European Laser Timing Instrumentation for the ACES Time Transfer using Laser Pulses](#)  
*Prochazka, Ivan<sup>1</sup>; Kodet, Jan<sup>1</sup>; Blazej, Josef<sup>1</sup>; Schreiber, Ulrich<sup>2</sup>; Cacciapuoti, Luigi<sup>3</sup>* G
- 09:20 [Time Transfer by Laser Link - T2L2: Current Status of the Validation Program](#)  
*Samain, Etienne<sup>1</sup>; Guillemot, Philippe<sup>2</sup>; Exertier, Pierre<sup>1</sup>; Pierron, Francis<sup>1</sup>; ALABANESE, Dominique* i
- 09:40 [A Coherent Optical Link through the Turbulent Atmosphere: Context and Applications](#)  
*Wolf, Peter<sup>1</sup>; Acef, Ouali<sup>1</sup>; Clairon, André<sup>1</sup>; Djerroud, Khelifa<sup>1</sup>; Lemonde, Pierre<sup>1</sup>; Man, Catherine<sup>2</sup>; Samain, Etienne* i
- 10:00 [VLBI Time-Transfer using CONT08 Data](#)  
*Rieck, Carsten<sup>1</sup>; Haas, Rüdiger<sup>2</sup>; Jaldehag, Kenneth<sup>3</sup>; Johansson, Jan* JG

**Session 8 - RF Acousto-electronic**

- 09:00 [Electrostrictive thin films for RF acoustic resonators](#)  
*Defay, E.; Le Rhun, G.; Sanchez, S.; Parat, G.; Billard, C.; Mercier, D. CEA Leti Minatoc* CE
- 09:20 [A 2D Transducer Structure for the Excitation of Surface Acoustic Wave](#)  
*Daniau, William<sup>1</sup>; Baron, Thomas<sup>2</sup>; Garcia, Julien<sup>1</sup>; Laroche, Thierry<sup>1</sup>; Ballandras, Sylvain* C
- 09:40 [Filter Synthesis using Shear-Wave Piezoelectric Layer Resonators](#)  
*Rigaudeau, Laetitia<sup>1</sup>; Monfraix, Philippe<sup>2</sup>; Ballandras, Sylvain<sup>3</sup>; Baron, Thomas<sup>3</sup>; Chatras, Matthieu<sup>4</sup>; Bila, Stéphane<sup>4</sup>; Cros, Dominique* GFG
- 10:00 [Fabrication of a 3 GHz Oscillator based on NANO-Carbon-DIAMOND-FILM-BASED Guided Wave Resonators](#)  
*Salut, Roland<sup>1</sup>; Gesset, Céline<sup>2</sup>; Martin, Gilles<sup>1</sup>; Saada, Samuel<sup>2</sup>; Assouar, Badreddine<sup>3</sup>; Bergonzo, Philippe<sup>2</sup>; Boudot, Rodolphe<sup>1</sup>; Bénédic, Fabien<sup>4</sup>; Elmazria, Omar<sup>3</sup>; Omnes, Franck<sup>5</sup>; Rémiens, Denis<sup>6</sup>; Ballandras, Sylvain* C

10:40 [Micromachined Thin film Plate Acoustic Resonators \(FPAR\): Theory and Applications](#)  
Yantchev, Ventsislav ; Katardjiev, Ilija  
Uppsala University (SWEDEN) G

11:00 Coffee break

### Session 9 - Timescales and Algorithms

11:20 [Real-Time Detection of Anomalies for Atomic Clocks in Space by Means of the GLRT](#)  
Nunzi, Emilia; Saltanocchi, Giorgio  
University of Perugia (ITALY) H

11:40 [Optimal and Unbiased FIR Estimates of Clock State for Space and Ground Applications](#)  
Shmaliy, Yuriy ; Ibarra-Manzano, Oscar  
Guanajuato University (MEXICO) €

12:00 [Ongoing Improvements of the Time and Frequency References at LNE-SYRTE](#)  
Abgrall, Michel ; Urich, Pierre ; Valat, David G

12:20 [Preliminary Results from NPL's Clock Ensemble Algorithm using Hydrogen Masers and Caesium Clocks](#)  
Shemar, Setnam ; Davis, John A. ; Whibberley, Peter B.  
National Physical Laboratory (UNITED KINGDOM) I

12:40 [Master Clock for Real Time Realization UTC\(SU\) Paper Clock](#)  
Koshelyaevsky, N. ; Pentin, S. G

### Session 10 - Stable Lasers

11:20 [An Ultra-Low Frequency Noise Agile Laser](#)  
Haboucha, Adil ; Jiang, Haifeng ; Kéfélian, Fabien ; Lemonde, Pierre ; Clairon,  
André ; Giorgio, Santarelli G

12:40 [The Space Time Asymmetry Research \(STAR\) Program](#)  
Braxmaier, Claus<sup>1</sup>; Schuldt, Thilo<sup>1</sup>; Allab, Mohammed<sup>1</sup>; von Zoest, Tim<sup>2</sup>; Theil,  
Stephan<sup>2</sup>; Pelivan, Ivanka<sup>2</sup>;  
Herrmann, Sven<sup>3</sup>; Lämmerzahl, Claus<sup>3</sup>; Peters, Achim<sup>4</sup>; Möhle, Katharina<sup>4</sup>; Wicht,  
Andreas<sup>4</sup>; Nagel, Moritz G H


13:00 Lunch break

### Session 11 - Microwave Clocks

14:40 [Realisation of a Compact Laser-Pumped Rubidium Frequency Standard with  \$< 1 \times 10^{-12}\$](#)

[Stability at 1 Second](#)

Affolderbach, Christoph<sup>1</sup>; Gruet, Florian<sup>2</sup>; Matthey, Renaud<sup>2</sup>; Miletì, Gaetano<sup>2</sup>

<sup>1</sup>Université de Neuchâtel (SWITZERLAND); <sup>2</sup>Université de Neuchâtel - LTF  F

### Session 12 - Calibration

14:00 [Toward new procedures in TWSTFT and GNSS delay characterization for UTC time](#)

[Transfer?](#)

Jiang, Z. ; Arias, E.F. ; Lewandowski, W. ; Petit, G.

Bureau International des Poids et Mesures (BIPM) (FRANCE)  J

14:20 [Absolute Calibration and Evaluation of Geodetic Receivers](#)

Proia, Amandine<sup>1</sup>; Cibiel, Gilles<sup>1</sup>; Yaigre, Leslie<sup>2</sup>

<sup>1</sup>CNES (FRANCE); <sup>2</sup>Sogethi High-Tech (FRANCE)  JI

14:40 [On Improved GPS-Based Calibration of the Time Links between METAS and PTB](#)

Feldmann, Thorsten<sup>1</sup>; Bauch, Andreas<sup>1</sup>; Piester, Dirk<sup>1</sup>; Stefanov, André<sup>2</sup>; Bernier,

Laurent-Guy<sup>2</sup>; Schlunegger, Christian<sup>2</sup>; Liang, Kun  IJ

15:40 Coffee break


### Poster Session I

16:10-18:00

P1.01

[A 2D model for bulk acoustic wave devices using a dyadic green's function of laminar plates](#)

Ballandras, Sylvain<sup>1</sup>; Daniau, William<sup>2</sup>; Garcia, Julien<sup>2</sup>; Laroche, Thierry<sup>2</sup>; Reinhardt, Alexandre

<sup>1</sup>CNRS/SENSeOR, (FRANCE); <sup>2</sup>CNRS, (FRANCE); <sup>3</sup>CEA-LETI, (FRANCE)  FH



P1.02

[Dual-Mode quartz resonators suitable for TCXO and OCXO](#)


*Kosykh, Anatoly ; Khomenko, Igor*

*Omsk State technical university, (RUSSIAN FEDERATION)*  GF

P1.03

[Modification of the intrinsic properties of GaAs, GaP and SiC samples under light at cryogenic temperatures](#)

*Mouneyrac, David<sup>1</sup>; Hartnett, John G.<sup>2</sup>; Le Floch, Jean-Michel<sup>2</sup>; Krupka, Jerzy<sup>3</sup>; Cros, Dominique<sup>1</sup>; Tobar, Michael E.<sup>2</sup>*

*<sup>1</sup>XLIM, (FRANCE); <sup>2</sup>FSM, (AUSTRALIA)*  GJ

P1.04

[Coupled modes in plano-convex bulk acoustic wave quartz resonators](#)

*Imbaud, Joël ; Dulmet, Bernard ; Bourquin, Roger*

*FEMTO-ST, (FRANCE)*  H

P1.05

[Resonator frequency stability contribution to the performance of ultrastable oscillators before and after integration](#)


*Salzenstein, Patrice<sup>1</sup>; Kuna, Alexander<sup>2</sup>; Sojdr, Ludvík<sup>2</sup>; Cemusova, Blanka<sup>2</sup>; Franquet, Nathalie<sup>1</sup>; Lefebvre, Frédéric*

 F

P1.06

[Miniature high-end space grade OCXO](#)

*Canzian, Patrice ; Schneller, Luc ; Trialoup, Claude; Candelier, Vincent ; Lamboley, Jacques*

*Rakon, (FRANCE)*  I

P1.07

[New state of the art of thermal sensitivity with Space Ultra Stable Quartz Crystal Oscillator](#)

*Schneller, Luc<sup>1</sup>; Canzian, Patrice<sup>1</sup>; Candelier, Vincent<sup>1</sup>; Galliou, Serge<sup>2</sup>; Cibiel, Gilles<sup>3</sup>*

*<sup>1</sup>Rakon, (FRANCE); <sup>2</sup>Femto-ST, (FRANCE); <sup>3</sup>CNES, (FRANCE)*  H

P.1.08

[A New Technique for Ultrahigh Resolution Comparison between Frequency Standards](#)

Zhao, Jie ; Zhou, Wei ; Chen, Faxi ; Li, Hong ; Ding, Ning ; Zou, Chengzhi

Xidian University, (CHINA)

P1.09

[Self-Identification of Differences between Aging Rates of Two Frequencies Excited in the Dual-Mode Crystal Oscillator](#)

Stofanik, Vladimir ; Minarik, Marian ; Balaz, Igor ; Cocherova, Elena ; Kozinka, Stanislav

FEI STU, (SLOVAKIA)

P1.10

[Correction of elastic, piezoelectric and dielectric constants of NdCa<sub>4</sub>O\(BO<sub>3</sub>\)<sub>3</sub> crystal using measured SAW parameters](#)

Brzozowski, Ernest ; Soluch, Waldemar

Institute of Electronic Materials Technology, (POLAND)

P1.12

[Dark-resonance in wall-coated cell for Rb-clocks](#)

Breschi, Evelina ; Mileti, Gaetano

University of Neuchâtel, (SWITZERLAND)

P1.13

[Fabrication and spectroscopy of Cs vapour cells with buffer gas for miniature atomic clock](#)

Miletic, Danijela<sup>1</sup>; Affolderbach, Christoph<sup>1</sup>; Breschi, Evelina<sup>1</sup>; Schori, Christian<sup>1</sup>; Miletic, Gaetano<sup>1</sup>; Hasegawa, Madoka<sup>2</sup>; Chutani, Ravinder<sup>2</sup>; Dziuban, Piotr<sup>2</sup>; Boudot, Rodolphe<sup>2</sup>; Giordano, Vincent<sup>2</sup>; Gorecki, Christophe<sup>2</sup>

<sup>1</sup>University of Neuchâtel, (SWITZERLAND); <sup>2</sup>FEMTO-ST, (FRANCE)

P1.14

[Development of passive hydrogen maser in Shanghai Astronomical Observatory](#)

Xie, Yonghui ; Dai, Jiayua ; Chen, Wenxing ; Liu, Tiexin ; Zhang, Yong ; Pen, Jixing ; Lin,

Chuanfu Shanghai Astronomical Observatory, (CHINA)

P1.16

[Pulsed optically pumped rb clock with optical detection: first results](#)

Micalizio, Salvatore<sup>1</sup>; Godone, Aldo<sup>1</sup>; Levi, Filippo<sup>1</sup>; Calosso, Claudio<sup>1</sup>; Bandi, Thejesh<sup>2</sup>; Pellaton, Matthieu<sup>2</sup>; Gruet, Florian<sup>2</sup>; Affolderbach, Christoph<sup>2</sup>; Miletic, Gaetano<sup>2</sup>

<sup>1</sup>Istituto Nazionale di Ricerca Metrologica, INRIM, (ITALY);

<sup>2</sup>Laboratoire Temps – Fréquence (LTF), Université de Neuchâtel, (SWITZERLAND)

P1.17

[Study of Rb 0-0 hyperfine double-resonance transition in a wall-coated cell](#)

Bandi, Thejesh ; Affolderbach, Christoph ; Mileti, Gaetano

Laboratoire Temps-Frequence, University of Neuchatel, Bellevaux 51, 2009 Neuchatel,

(SWITZERLAND) UÎ

P1.19

[Low Temperature Indium-based Sealing of Microfabricated Alkali Cells for Chip Scale Atomic Clocks](#)

Pétrémand, Yves <sup>1</sup>; Schori, Christian <sup>2</sup>; Straessle, Rahel <sup>1</sup>; Mileti, Gaetano <sup>2</sup>; de Rooij, Nico <sup>1</sup>; Thomann, Pierre <sup>2</sup>

<sup>1</sup>Ecole Polytechnique Fédérale de Lausanne (EPFL), (SWITZERLAND); <sup>2</sup>LTF, University of

Neuchatel, (SWITZERLAND) €

P1.20

[Measurements of Cs-buffer gas collisional frequency shift using CPT interrogation](#)

Kozlova, Olga <sup>1</sup>; Boudot, Rodolphe <sup>2</sup>; Guérandel, Stéphane <sup>1</sup>; De Clercq, Emeric <sup>1</sup>

<sup>1</sup>Observatoire de Paris - LNE-SYRTE, (FRANCE); <sup>2</sup>FEMTO-ST, Time & Frequency Dpt,

(FRANCE) €

P1.21

[Progress on passive H-maser for Compass system](#)

Yang, Ren-fu ; Li, Jing ; Chen, Hai-bo ; Zhang, Ji-hong ; Gao, Lian-shan

Beijing Institute of Radio Metrology & Measurement, (CHINA) FG

P1.23

[The Compensation and Processing Techniques Used for Rubidium Frequency Standards](#)

Zhou, Wei ; Ding, Ning ; Zou, Chengzhi ; Li, Hong

Xidian University, (CHINA) FÎ

P1.24

[FM Spectroscopy of Nonlinear Magneto-Optical Resonances](#)

Baryshev, Viacheslav

FGUP VNIIFTRI, (RUSSIAN FEDERATION) GG

P1.25

[CPT Atomic Clock based on Rubidium 85](#)

Schori, C. <sup>1</sup>; Mileti, G. <sup>1</sup>; Leuenberger, B. <sup>2</sup>; Rochat, P. <sup>2</sup>

<sup>1</sup>University Neuchâtel, Time- Frequency Laboratory (LTF), (SWITZERLAND) GÏ

P1.27

[Advances in the development of an eXtra Small Atomic Reference \(XSAR\)](#)

Haesler, Jacques ; Lecomte, Steve

Centre Suisse d'Electronique et de Microtechnique (CSEM) SA, (SWITZERLAND) HF

P1.28

[Progress Towards a Strontium Optical Lattice Clock at NPL](#)

Bridge, Elizabeth M.<sup>1</sup>; Hill, Ian R.<sup>2</sup>; Barwood, Geoffrey P.<sup>3</sup>; Curtis, E. Anne<sup>2</sup>; Gill, Patrick<sup>4</sup>

<sup>1</sup>National Physical Laboratory and University of Oxford, (UNITED KINGDOM); <sup>2</sup>National Physical Laboratory and Imperial College London, (UNITED KINGDOM); <sup>3</sup>National Physical Laboratory, (UNITED KINGDOM); <sup>4</sup>National Physical Laboratory, University of Oxford and Imperial College London, (UNITED KINGDOM) H

P1.30

[Development of a transportable laser cooled strontium source for future applications in space](#)

Schioppo, Marco<sup>1</sup>; Tino, G.M.<sup>1</sup>; Poli, N.<sup>1</sup>; Tarallo, M.G.<sup>1</sup>; Sutyryn, D.V.<sup>1</sup>; Prevedelli, M.<sup>1</sup>;

Sorrentino, F.<sup>1</sup>; Lisdat, Ch.<sup>2</sup>; Vellere Winfred, J.S.R.<sup>2</sup>; Falke, S.<sup>2</sup>; Sterr, U.<sup>2</sup>; Legero, T.<sup>2</sup>; Riehle, F.<sup>2</sup>; Cacciapuoti, Luigi HF | F

P1.31

[The ACES GNSS subsystem and its applications](#)

Hess, Marc Peter<sup>1</sup>; Helm, Achim<sup>2</sup>; Cacciapuoti, Luigi<sup>3</sup>; Feltham, Stephen<sup>3</sup>; Much, Rudolf<sup>3</sup>;

Nasca, Rosario<sup>3</sup>; Montenbruck, Oliver<sup>4</sup>; Gribov, Alexander<sup>5</sup>

<sup>1</sup>Astrium Space Transportation, Germany, (GERMANY); <sup>2</sup>Astrium Space Transportation, (GERMANY) | i

P1.33

[Improvement of Asia-Pacific TWSTFT Results Utilizing Full Time Transfer Network Data](#)

Lin, Huang-Tien; LIAO, Chia-Shu ; Chu, Fang-Dar ; Tseng, Wen-Hung

National Time and Frequency Standard Laboratory, (TAIWAN) | i

P1.34

[Timing accuracy analysis using height as virtual satellite](#)

Shan, Qingxiao ; Yueke, Wang ; Jun, Yang ; Jianyun, Chen

National University of Defense Technology, (CHINA) i €

P1.39

[Simulation of servo loops in atomic clock ensemble in space \(aces\)](#)

Dam, Joydeep Kumar <sup>1</sup>; Schaefer, Wolfgang <sup>1</sup>; Hejc, Gerhard <sup>1</sup>; Hess, Marc-Peter <sup>2</sup>; Stringhetti, Luca <sup>2</sup>; Kehrler, Johannes <sup>2</sup>; Cacciapuoti, Luigi

P1.42

[An ultra stable event timer designed for T2L2](#)

Samain, Etienne <sup>1</sup>; Fridelance, Patricia <sup>2</sup>; Guillemot, Philippe

P1.43

[Timing method by simulated GPS radio signal](#)

Shan, Qingxiao ; Wang, Yueke ; Yang, Jun ; Chen, Jianyun

National University of Defense Technology, (CHINA)

P1.44

[Restoring a TWSTFT Calibration with a GPS Bridge](#)

Jiang, Zhiheng <sup>1</sup>; Piester, D. <sup>2</sup>; Liang, K. <sup>3</sup>

<sup>1</sup>Bureau International des Poids et Mesure

P1.46

[Performance evaluation of NIM GPS receivers in use for time transfer with PTB](#)

Liang, Kun <sup>1</sup>; Feldmann, Thorsten <sup>2</sup>; Bauch, Andreas <sup>2</sup>; Piester, Dirk <sup>2</sup>; Zhang, Aimin <sup>1</sup>; Gao,

Xiaoxun

P1.48

[Demonstration of a cryocooled 10 GHz oscillator with 1e-15 frequency stability](#)

Grop, Serge <sup>1</sup>; Bourgeois, Pierre Yves <sup>1</sup>; Bazin, Nicolas <sup>1</sup>; Kersalé, Yann <sup>1</sup>; Rubiola, Enrico Langham, Conway <sup>2</sup>; Oxborrow, Mark <sup>2</sup>; De Vicente, Javier <sup>3</sup>; Giordano, Vincent <sup>1</sup>

<sup>1</sup>Institut FEMTO-ST, (FRANCE); <sup>2</sup>National Physical Laboratory, (UNITED KINGDOM);

<sup>3</sup>European Space Agency, (GERMANY)

P1.51

[Topology dependence of mass sensitivities in mode localized sensors](#)

Thiruvenkatanathan, Pradyumna ; Yan, Jize ; Seshia, Ashwin

University of Cambridge, (UNITED KINGDOM)

P1.54

[Filter Synthesis using Shear-Wave Piezoelectric Layer Resonators](#)

Catherinot, L.<sup>1</sup>; Baron, T.<sup>2</sup>; Monfraix, P.<sup>3</sup>; Rigaudeau, L.<sup>4</sup>; Ballandras, S.

; Chatras, M.<sup>1</sup>; Bila, S.<sup>1</sup>; Cros, D.  FF

18:30-22:00 Conference Dinner - Kasteel Oud Wassenaar

**Thursday, 15 April 2010**

**Session 13 - T&F Transfer**


09:40 [On the Correlation of Tropospheric Zenith Path Delay and Station Clock Estimates in Geodetic GNSS Frequency Transfer](#)

Weinbach, Ulrich; Schön, Steffen

Leibniz Universität Hannover (GERMANY)  FI


10:00 [Long-term Inconsistency of TWSTFT and GPS Time Transfers Results In PTB-TL and NICT-TL Time Links](#)

Lin, Calvin. S.Y.<sup>1</sup>; Feng, Kai-Ming<sup>2</sup>; Lin, Huang-Tien<sup>1</sup>; Huang, Yi-Jiung<sup>1</sup>

<sup>1</sup>Telecommunication Labs (TAIWAN); <sup>2</sup>National Tsing Hua University (TAIWAN)  GI

10:20 [Near-Real Time Synchronization through a Network of GNSS Receivers Located in Timing Laboratories](#)

Cerretto, Giancarlo<sup>1</sup>; Perucca, Andrea<sup>2</sup>; Tavella, Patrizia<sup>2</sup>; Píriz, Ricardo<sup>3</sup>

<sup>1</sup>INRIM - Politecnico di Torino (DISPEA) (ITALY); <sup>2</sup>INRIM (ITALY); <sup>3</sup>GMV (SPAIN)  GJ

**Session 14 - Oscillators and Noise**

09:20 [Demonstration of a Cryocooled 10 GHz Oscillator with 1e-15 Frequency Stability](#)


Grop, Serge<sup>1</sup>; Bourgeois, Pierre Yves<sup>1</sup>; Bazin, Nicolas<sup>1</sup>; Kersalé, Yann<sup>1</sup>;






Rubiola, Enrico<sup>1</sup>; Langham, Conway<sup>2</sup>;

Oxborrow, Mark<sup>2</sup>; De Vicente, Javier<sup>3</sup>; Giordano, Vincent  HI











09:40 [DC-powered Fe<sup>3+</sup>:sapphire Maser and its Sensitivity to Ultraviolet Light](#)

Oxborrow, Mark<sup>1</sup>; Bourgeois, Pierre-Yves<sup>2</sup>; Kersalé, Yann<sup>2</sup>; Giordano, Vincent<sup>2</sup>



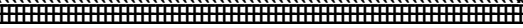


<sup>1</sup>NPL (UNITED KINGDOM); <sup>2</sup>Institut FEMTO-ST (FRANCE)  IÎ

- 10:00 [Cross Correlation Residual Phase Noise Measurements using Two HP3048-A Systems and a PC Based dual channel FFT Spectrum Analyser](#)  
*Bale, Simon*<sup>1</sup>; *Adamson, David*<sup>2</sup>; *Wakley, Brett*<sup>1</sup>; *Everard Jeremy*  
- 10:20 [The Phase Noise Spectrum and Structure of Photons](#)  
*Underhill, Mike*  
*Underhill Research (UNITED KINGDOM)*   
- 10:40 Coffee break

### Session 15 - GNSS Timing II

- 11:20 [Performance Overview of Space Rubidium Standards](#)  
*Droz, Fabien* ; *Rochat, Pascal* ; *Wang, Qinghua*  
*SpectraTime (SWITZERLAND)*   
- 11:40 [Space Passive Hydrogen Maser - Performances, Lifetime Data and GIOVE-B Related Telemetries](#)  
*Belloni, Marco*<sup>1</sup>; *Droz, Fabien*<sup>2</sup>; *Resti, Alberto*<sup>3</sup>; *Mosset, Pierre*<sup>2</sup>; *Ostilio, Alessandra*<sup>3</sup>; *Beretta, Simone*<sup>1</sup>; *Gioia, Marina*<sup>1</sup>; *Waller, Pierre*<sup>3</sup>; *Qinghua, Wang*  
- 12:00 [A Simulation of the Effect of Improved Ground Clocks on GPS Timing Performance](#)  
*Suess, Matthias*<sup>1</sup>; *Matsakis, Demetrios*<sup>2</sup>  
<sup>1</sup>*German Aerospace Center (GERMANY)*  
- 12:20 [Future Concepts for On-Board Timing Subsystems for Navigation Satellites](#)  
*Felbach, Dirk* ; *Soualle, Francis* ; *Stopfkuchen, Lars* ; *Zenzinger, Alexander*  
*Astrium GmbH (GERMANY)*   
- 12:40 [Optical Clock Technology for Optimized Satellite Navigation](#)  
*Plattner, Markus P.*<sup>1</sup>; *Hugentobler, Urs*<sup>2</sup>; *Voithenleitner, Dominik*<sup>2</sup>; *Markus, Heinze Klein, Volker Kemmerle, Kurt*<sup>1</sup>; *Bedrich, Stefan*<sup>1</sup>  
*Kayser-Threde GmbH (GERMANY);*<sup>2</sup>*Technische Universitaet Muenchen*   

### Session 16 - Frequency Combs

- 11:20 [Invited Presentation - First Fully Stabilized Frequency Comb from a SESAM - Modelocked 1.5- μm Solid-State](#)  
*Stumpf, Max C.*<sup>1</sup>; *Pekarek, Selina*<sup>1</sup>; *Oehler, Andreas E. H.*<sup>1</sup>; *Südmeyer, Thomas*<sup>1</sup>; *Dudley, John M.*<sup>2</sup>; *Keller, Ursula*<sup>1</sup>  
<sup>1</sup>*ETH Zurich (SWITZERLAND);*<sup>2</sup>*Université de Franche-Comté (FRANCE)*  
- 12:00 [Ultra-Low Noise Microwave Extraction from Fiber-Based Optical Frequency Comb](#)  
*Zhang, Wei* ; *Xu, Z.* ; *Millo, J.* ; *Boudot, R.* ; *Lours, M.* ; *Bourgeois, P. Y.* ; *Luiten, A. N. Le Coq, Y. Kersalé, Y.*<sup>2</sup>; *Santarelli, G. LNE-SYRTE, Observatoire de Paris, CNRS, UPMC (FRANCE);*<sup>2</sup>*FEMTO-ST Institute, CNRS and ENSMM*   

12:20

[Optical Frequency Combs and Applications at NPL](#)

Margolis, Helen <sup>1</sup>; Marra, Giuseppe <sup>1</sup>; Tsaturian, Veronika <sup>1</sup>

Lea, Stephen <sup>1</sup>; Reid, Derryck <sup>2</sup>; Gill, Patrick ; Walton, Barney  F Í

13:00 Lunch break

**Poster Session II**

14:00-15:40

P2.01

[Multi-channel real-time computation of ADEV and TDEV](#)

Kasznia, Michal

Poznan University of Technology, (POLAND)  GG

P2.02

[Joint real-time computation of Allan deviation, time deviation, and Hadamard deviation](#)

Dobrogowski, Andrzej ; Kasznia, Michal

Poznan University of Technology, (POLAND)  GJ

P2.03

[Hardware and software realization of time error measurement with real-time assessment of ADEV, TDEV, and MTIE](#)

Dobrogowski, Andrzej ; Jessa, Mieczyslaw ; Kasznia, Michal ; Lange, Krzysztof ; Jaworski, Michal  H Í

P2.04

[From Allan Variance to Phase Noise: A New Conversion Approach](#)

Zhang, Shengkang ; Wang, Hongbo ; Wang, Xueyun ; Yang, Jun

Beijing Institute of Radio Metrology and Measurement, (CHINA)  I I

P2.05

[Thermal sensitivity of a DMTD used in a composite clock](#)

Plantard, Cédric ; Vernotte, François ; Meyer, Eric

Observatoire de Besançon, (FRANCE)  Í G

P2.07

[An Algorithm for Automating Fast and Accurate Measurements of the Resonance Frequencies](#)

Droit, Christophe <sup>1</sup>; Friedt, Jean-Michel <sup>1</sup>; Ballandras, Sylvain <sup>2</sup>; Martin, Gilles  Í ï



P2.08

[Heatproof microwave sensors. Flame parameters diagnostics in combustion chambers of the different engine types](#)

Safonova, Ekaterina ; Boloznev, Victor

Kazan State Technical University, (RUSSIAN FEDERATION) i i

P2.09

[Phase errors in surface acoustic wave devices under rotation](#)

Nikolaevtsev, Victor ; Suchkov, Sergey

Saratov State University, (RUSSIAN FEDERATION) i GÁ

P2.10

[The Progress of Strontium Optical Lattice Clock at NIM](#)

Wang, Shao-Kai ; Wang, Qiang ; Li, Ye ; Lin, Yi-Ge ; Wang

Zang, Er-Jun ; Li, Tian-Chu ; Fang, Zhan-Jun , Min-Ming ; Lin, Bai-Ke ; Zhao, Yang i i

P2.12

[High performance iodine frequency reference for tests of the LISA laser system](#)

Doeringshoff, Klaus ; Moehle, Katharina ; Nagel, Moritz ; Kovalchuk, Evgeny V. ; Peters, Achim

Institut fuer Physik, AG Optische Metrologie, Humboldt Universitaet zu Berlin, (GERMANY) i F

P2.13

[Piezo-Tunable High Finesse Cavity for LISA](#)

Moehle, Katharina ; Doeringshoff, Klaus ; Nagel, Moritz ; Kovalchuk, Evgeny V. ; Peters, Achim

Humboldt Universitaet zu Berlin, Institut für Physik, (GERMANY) i i

P2.16

[A clock laser with high frequency stability and highly precise transfer](#)

Li, Ying <sup>1</sup>; Nagano, Shigeo <sup>2</sup>; Matsubara, Kensuke <sup>2</sup>; Ito, Hiroyuki <sup>2</sup>; Kajita, masatoshi <sup>2</sup>;

Hosokawa, Mizuhiko i JG

P2.19

[Low Noise Optical Link Development at INRIM](#)

Mura, Alberto <sup>1</sup>; Bastida, Karina <sup>2</sup>; Levi, Filippo <sup>1</sup>; Calonico, Davide <sup>1</sup>; Lorini, Luca <sup>1</sup>; Costanzo, Giovanni Antonio <sup>3</sup>; Godone, Aldo <sup>1</sup>

<sup>1</sup>INRIM, (ITALY); <sup>2</sup>INTI, (ARGENTINA); <sup>3</sup>Politecnico di Torino, (ITALY) €€

P2.23

[Demonstration of an optical frequency synthesizer with zero offset frequency stabilization by the direct locking method](#)

Eok Bong, Kim <sup>1</sup>; Jae-hwan, Lee <sup>2</sup>; Luu Tran, Trung <sup>2</sup>; Won-Kyu, Lee <sup>1</sup>; Dai-Hyuk, Yu <sup>1</sup>; Han Young, Ryu <sup>1</sup>; Chang Hee, Nam <sup>2</sup>; Chang Yong, Park <sup>1</sup>

<sup>1</sup>Korea Research Institute of Standards and Science, (REPUBLIC OF KOREA); <sup>2</sup>Korea Advanced Institute of Science and Technology, (REPUBLIC OF KOREA) €

P2.24

[Frequency dissemination with free-space optical links](#)

Mata Calvo, Ramon ; Moll, Florian ; Knapek, Markus ; Giggenbach, Dirk

DLR - Deutsches Zentrum für Luft- und Raumfahrt, (GERMANY) FH

P2.25

[Development of an Ultrastable Laser in the 1.5 µm Band for CW Optical Frequency Transfer over Optical Fibre](#)

Parker, Benjamin <sup>1</sup>; Webster, Stephen <sup>1</sup>; Lea, Stephen <sup>1</sup>; Gill, Patrick <sup>1</sup>; Bayvel, Polina <sup>2</sup>

<sup>1</sup>National Physical Laboratory, (UNITED KINGDOM); <sup>2</sup>Department of Electronic and Electrical Engineering, University College London, (UNITED KINGDOM) GF

P2.27

[Yb lattice clock at INRIM](#)

Calonico, Davide <sup>1</sup>; Levi, Filippo <sup>1</sup>; Lorini, Luca <sup>1</sup>; Costanzo, Giovanni Antonio <sup>2</sup>; Bertacco, Elio Keith <sup>1</sup>; Zoppi, Marco <sup>2</sup>; Godone, Aldo <sup>1</sup>

<sup>1</sup>Istituto Nazionale di Ricerca Metrologica INRIM, (ITALY); <sup>2</sup>Politecnico di Torino, (ITALY) GJ

P2.28

[The statistical uncertainty associated with the weighted mean frequency in optical frequency comb comparison](#)

Lee, Won-Kyu ; Yu, Dai-Hyuk ; Park, Chang Yong ; Mun, Jongchul

Korea Research Institute of Standards and Science, (KOREA, REPUBLIC OF) H

P2.31

[Development of a Frequency Stabilized Nd: YAG Laser for Space Applications](#)

Turazza, Oscar <sup>1</sup>; Lours, Michel <sup>2</sup>; Holleville, David <sup>3</sup>; Du Burck, Frederic <sup>4</sup>; Auger, Gérard <sup>5</sup>; Brillet, Alain <sup>6</sup>; Clairon, André <sup>2</sup>; Acef, Ouali <sup>2</sup>

<sup>1</sup>SYRTE/APC/Observatoire de Paris, (FRANCE); <sup>2</sup>LNE-SYRTE / Observatoire de Paris/CNRS-UMR8630/UPMC-Paris 6, (FRANCE); <sup>3</sup>LNE-SYRTE-Observatoire de Paris-CNRS, (FRANCE) I H

P2.32

[A simple approach to evaluate the linewidth of a laser from its frequency noise spectral density](#)

Di Domenico, Gianni ; Dolgovskiy, Vladimir ; Schilt, Stéphane ; Thomann, Pierre

LTF, Université de Neuchâtel, (SWITZERLAND) I

P2.35

[A coherent optical link through the turbulent atmosphere](#)

Djerroud, Khelifa <sup>1</sup>; Acef, Ouali <sup>1</sup>; Clairon, André <sup>1</sup>; Lemonde, Pierre <sup>1</sup>; Man, Catherine <sup>2</sup>; Samain,

Etienne; Wolf, Peter I H

P2.36

[Precise determination of the refractive index of air in Fabry-Perot cavity by means of the optical frequency comb](#)

*Smid, Radek ; Cip, Ondrej ; Mikel, Bretislav ; Buchta, Zdenek ; Cizek, Martin ; Lazar, Josef*

*Institute of Scientific Instruments of AS CR, (CZECH REPUBLIC)* | J

P2.39

[Interpolation of TW time transfer from measured points onto standard MJD for UTC generation](#)

*Jiang, Zhiheng*

*Bureau International des Poids et Mesures (BIPM), (FRANCE)* | I

P2.40

[New time scale at the Royal Observatory of Belgium](#)

*Sharma, Suman ; Defraigne, Pascale*

*Royal Observatory of Belgium, (BELGIUM)* | F

P2.41

[Precise point positioning: implementation of the constrained clock model and analysis of its effects in t/f transfer](#)

*Cerretto, Giancarlo<sup>1</sup>; Lahaye, François<sup>2</sup>; Tavella, Patrizia<sup>3</sup>; Vitrano, Sergio<sup>4</sup>*

*<sup>1</sup>INRIM - Politecnico di Torino (DISPEA), (ITALY); <sup>2</sup>NRCan, (CANADA); <sup>3</sup>INRIM, (ITALY);*

*<sup>4</sup>Politecnico di Torino, (ITALY)* | I

P2.43

[Requirements on GNSS receivers from the perspective of timing applications](#)

*Defraigne, Pascale<sup>1</sup>; Uhrich, Pierre<sup>2</sup>; Petit, Gérard<sup>3</sup>; Aerts, Wim<sup>1</sup>*

*<sup>1</sup>Royal Observatory of Belgium, (BELGIUM); <sup>2</sup>3LNE-SYRTE, LNE, CNRS, UPMC, Observatoire de Paris, (FRANCE);*

*<sup>3</sup>Bureau International des Poids et Mesures, (FRANCE)* | J

P2.44

[Maintenance of UTC\(MIKE\) in Finland by using a delay generator as a micro stepper](#)

*Mansten, Tapio ; Kalliomaki, Kalevi ; Iisakka, Ilkka ; Merimaa, Mikko*

*MIKES, (FINLAND)* | I

P2.45

[Experimental Analysis of the Time Transfer Capability of BD-I](#)

Yang, Zhiqiang

Beijing Institute of Radio Metrology and Measurement, (CHINA) JG

P2.46

[GPS receiver relative calibration campaign preparation for Galileo In-Orbit Validation](#)

Uhrich, Pierre ; Valat, David

LNE-SYRTE, LNE, CNRS, UPMC, Observatoire de Paris, (FRANCE) JÎ

P2.48

[New technologies for laser time transfer and their possible application in the Galileo Programme](#)

Prochazka, Ivan <sup>1</sup>; Schreiber, Ulrich <sup>2</sup>; Schäfer, Wolfgang <sup>3</sup>; Cacciapuoti, Luigi <sup>4</sup>

<sup>1</sup>Czech Technical University in Prague, (CZECH REPUBLIC); <sup>2</sup>BKG & Technical University

Munich, (GERMANY);

<sup>3</sup>Time Tech GmbH, (GERMANY); <sup>4</sup>ESA/ESTEC (NETHERLANDS) E

P2.50

[Development Status and Experimental Plan of Time Management System of Satellite Positioning System using QZSS](#)

Takahashi, Yasuhiro <sup>1</sup>; Amagai, Jun <sup>1</sup>; Fujieda, Miho <sup>1</sup>; Nakamura, Maho <sup>1</sup>; Aida, Masanori <sup>1</sup>;

Nakazawa, Isao <sup>1</sup>; Hama, Shin'ichi <sup>1</sup>; Noda, Hiroyuki <sup>2</sup>; Kishimoto, Motohisa <sup>2</sup>; Yahagi, Yukihiro <sup>3</sup>;

Horiuchi, Satoshi <sup>4</sup>; Takahashi, Tamaki FF

P2.51

[Results of evaluation of time signals receiving from NTP servers in Poland](#)

Dobrogowski, Andrzej ; Jessa, Mieczyslaw ; Kasznia, Michal ; Lange, Krzysztof

Poznan University of Technology, (POLAND) F

P2.54

[Langasite resonant structures: fabrication and characterization](#)

Leblois, Therese <sup>1</sup>; Le Traon, Olivier <sup>2</sup>

<sup>1</sup>FEMTO-ST Institute, (FRANCE); <sup>2</sup>ONERA, (FRANCE) G

P2.55

[Investigating  \$Dm = \pm 1\$  Transitions in a Caesium Fountain Clock - Challenges in Precision Measurements of the g-Factor Ratio](#)

Nemitz, Nils ; Gerginov, Vladislav ; Wynands, Robert ; Weyers, Stefan

Physikalisch-Technische Bundesanstalt, (GERMANY)  HH

P2.56

[GGTO and UTC Dissemination results in GIOVE-Mission](#)

Mudrak, Alexander<sup>1</sup>; Gaetano, Galluzzo<sup>2</sup>

<sup>1</sup>ESA/ESTEC, (NETHERLANDS); <sup>2</sup>VEGA, (NETHERLANDS)  HI

15:40 Coffee break

**Session 17 - ACES**

16:10 [ACES Status at Completion of the Engineering Models Phase](#)

Cacciapuoti, L.<sup>1</sup>; Much, R.<sup>1</sup>; Feltham, S.<sup>1</sup>; Nasca, R.<sup>1</sup>; Vudali, T.


Stringhetti, L.<sup>2</sup>; Salomon, C.<sup>3</sup>; Hess, M.P.  I I

16:30 [Development of the Space Active Hydrogen Maser for the Aces Mission](#)

Goujon, Didier<sup>1</sup>; Rochat, Pascal<sup>1</sup>; Mosset, Pierre<sup>1</sup>; Boving, Daniel<sup>1</sup>; Perri, Antonio<sup>1</sup>;

Rochat, Julien<sup>1</sup>; Ramanan, Neetha<sup>1</sup>; Simonet, Didier<sup>1</sup>; Vernez, Xavier<sup>2</sup>; Perruchoud,

Gérald Spectratime SA (SWITZERLAND); <sup>2</sup>T4Science (SWITZERLAND);

<sup>3</sup>CSEM (SWITZERLAND)  I I

17:10 [Results of the ACES Engineering Model System Test](#)

Hess, Marc Peter<sup>1</sup>; Stringhetti, Luca<sup>1</sup>; Cacciapuoti, Luigi<sup>2</sup>; Feltham, Steve<sup>2</sup>;

Much, Rudolf<sup>2</sup>; Vudali, Tahsin, Salomon, Christophe<sup>3</sup>; Laurent, Phillippe<sup>4</sup>; Benoit, Leger

Delaroche, Christophe<sup>5</sup>; Massonnet, Didier, Picard, Frederic<sup>5</sup>; Hejc, Gerhard  I F

17:30 Closing Session