

Monday, 12 April 2010

17:30 Pre-registration and Welcome Drink

Tuesday, 13 April 2010

09:00 Welcome and Introduction

09:15 Invited Plenary Presentation

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

Beutler, Gerhard¹; Hugentobler, Urs²; Jaeggi, Adrian¹;

¹Astronomical Institute, University of Bern (SWITZERLAND); ²Institute for Astronomical Geodesy, Technical University of Munich (GERMANY)

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-Jacques¹; Nguyen Thi Kim, Ngan²; Devautour-Vinot, Sabine³; Frayret, Jérôme⁴

¹FEMTO-ST Institute (FRANCE); ²Frequency and Time Dpt, Femto-st Institute, Besancon (FRANCE); ³Charles Gerhardt Institute, University of Montpellier (FRANCE); ⁴LCABIE, Université de Pau et des Pays de l'Adour (FRANCE)

11:40 Role of Alkali Ions in the Radiation Sensitivity of the Quartz Crystal
Lefèvre, Jérémie¹; Cambon, Olivier¹; Devautour-Vinot, Sabine¹; Guibert, Pierre²; Frayret, Jérôme³; Boy, Jean-Jacques⁴; Picchedda, Delphine⁵; Cibié, Gilles⁶
¹Institut Charles Gerhardt (FRANCE); ²IRAMAT (FRANCE); ³LCABIE (FRANCE); ⁴FEMTO-ST (FRANCE); ⁵GEMMA Quartz & Crystal (FRANCE); ⁶CNES (FRANCE)

12:00 Analyzes of Very High Q Quartz Crystal Aimed to High Quality 5 Mhz Resonators Achievement
Imbaud, Joël¹; Boy, Jean Jacques¹; Picchedda, Delphine²; Cibié, Gilles³; Sthal, Fabrice¹
¹FEMTO-ST Institute (FRANCE); ²Gemma (FRANCE); ³CNES (FRANCE)

12:20 Compact Optoelectronic Oscillator with Minidisk Resonator
Salzenstein, Patrice¹; Volyanskiy, Kirill²; Pogumerskiy, Maxim³; Tavernier, Hervé¹; Rubiola, Enrico¹; Larger, Laurent¹
¹CNRS - FEMTO-ST (FRANCE); ²SUAI (RUSSIAN FEDERATION); ³ITMO (RUSSIAN FEDERATION)

- 12:40 Oscillator Phase Noise Optimization and Correction
Goryachev, Maxim ; Galliou, Serge ; Abbe, Philippe
FEMTO-ST Institute (FRANCE)

Session 2 - Cold Atom Clocks

- 11:20 Invited Presentation-Measurement of the Rb Ground State Hyperfine Splitting with Atomic Fountains
Ovchinnikov, Yuri ; Szymaniec, Krzysztof ; Marra, Giuseppe
National Physical Laboratory (UNITED KINGDOM)
- 12:00 Uncertainty Evaluation and Recent Improvements of the Fountain Primary Frequency Standard CSF2 at PTB
Gerginov, Vladislav ; Nemitz, Nils ; Griebisch, Dieter ; Kazda, Michael ; Wynands, Robert ; Weyers, Stefan
Physikalisch-Technische Bundesanstalt (GERMANY)
- 12:20 Characterization of the Distributed Cavity Phase Shift in FO2 for Improving the Accuracy of SYRTE Fountain Clocks
Guéna, Jocelyne ¹; Abgrall, Michel ¹; Rovera, Daniele ¹; Rosenbusch, Peter ¹; Santarelli, Giorgio ¹; Tobar, Michael E. ²; Laurent, Philippe ¹; Gibble, Kurt ³; Bize, Sébastien ¹; Clairon, André ¹
¹SYRTE, Observatoire de Paris (FRANCE); ²University of Western Australia (AUSTRALIA); ³Pennstate University (UNITED STATES)
- 12:40 Dick Effect and Long Term Stability Evaluation of HORACE Compact Cold Atom Clock
Rossetto, Nicolas ¹; Chapelet, Frederic ¹; Esnault, Francois-Xavier ¹; Lambert, Raphael ¹; Lours, Michel ¹; Holleville, David ¹; Dimarcq, Noel ¹; Delporte, Jerome ²
¹SYRTE - Observatoire de Paris - CNRS (FRANCE); ²CNES (FRANCE)
- 13:00 Lunch break

Session 3 - GNSS Timing I

- 14:00 Long-term Performances of GIOVE On-board Clocks
Waller, Pierre ¹; Gonzalez, Francisco ¹; Binda, Stefano ¹; Hidalgo, Irene ²; Tobias, Guillermo ²; Sesia, Ilaria ³; Cernigliaro, Alice ³; Tavella, Patrizia ³
¹ESA (NETHERLANDS); ²GMV (SPAIN); ³INRIM (ITALY)
- 14:20 Evaluation of GIOVE Satellite Clocks using the CONGO Network
Hugentobler, Urs ¹; Steigenberger, Peter ¹; Montenbruck, Oliver ²; Hauschild, Andre ²; Weber, Georg ³; Hessels, Uwe ³
¹Technische Universität München (GERMANY); ²German Aerospace Center (GERMANY); ³Federal Agency for Cartography and Geodesy (GERMANY)
- 14:40 Clock Prediction Experimentation with GIOVE Clocks
Gonzalez, Francisco ¹; Cernigliaro, Alice ²; Patrizia, Tavella ²
¹ESA (NETHERLANDS); ²INRIM (ITALY)

15:00 Galileo Common View: Format, Processing and Tests with GIOVE
Mudrak, Alexander¹; Defraigne, Pascale²; Binda, Stefano¹; Brunet, Michel³
¹ESA (NETHERLANDS); ²Royal Observatory of Belgium (ORB) (BELGIUM); ³Timing Expert (FRANCE)

15:20 European GNSS On-board Clocks: Status and Perspectives
Waller, Pierre
ESA (NETHERLANDS)

Session 4 - Optical Clocks

14:00 Prospects and Experiments for Pushing the Frequency Stability of Optical Lattice Clocks to the Quantum Limit
Westergaard, Philip¹; Lodewyck, Jérôme¹; Lecallier, Arnaud¹; Lorini, Luca²; Lemonde, Pierre¹
¹LNE-SYRTE (FRANCE); ²INRIM (ITALY)

14:20 New Nonlinear and Multipole Effects on Optical Lattice Clock
Palchikov, Vitaly¹; Marmo, Sergey²; Ovsiannikov, Vitaly²; Taichenachev, Aleksey³; Yudin, Valery³; Katori, Hidetochi⁴; Takamoto, M.⁴
¹FGUP VNIIFTRI (RUSSIAN FEDERATION); ²Department of Physics, Voronezh State University (RUSSIAN FEDERATION); ³Institute of Laser Physics, Novosibirsk (RUSSIAN FEDERATION); ⁴University of Tokyo (JAPAN)

14:40 Toward a Mercury Optical Lattice Clock: Development of a Dipole Lattice Trap
Mejri, Sinda ; Yi, Lin ; McFerran, John J. ; Bize, Sébastien
SYRTE, Observatoire de Paris (FRANCE)

15:00 High-Resolution Laser Spectroscopy of the 467 Nm S - F Electric Octupole Transition In Yb+
Peik, Ekkehard ; Huntemann, Nils ; Sherstov, Ivan ; Okhapkin, Maxim ; Lipphardt, Burghard ; Tamm, Christian
PTB (GERMANY)

15:20 Strontium Ion Optical Clocks for Space Applications
Barwood, Geoffrey ; Gill, Patrick ; Huang, Guilong ; Klein, Hugh
National Physical Laboratory (UNITED KINGDOM)

15:40 *Coffee break*

Session 5 - Resonant Sensors

16:10 Invited Presentation-Advances in Chip-Scale Atomic Magnetometers
Knappe, Svenja ; Griffith, W. Clark ; Preusser, Jan ; Mhaskar, Rahul ; Jimenez-Martinez, Ricardo ; Kitching, John
NIST (UNITED STATES)

- 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)
- 17:10 BAW Pressure Sensor on LiNbO₃ Membrane Lapping
Baron, Thomas¹ ; Masson, Jeremie² ; Romand, Jean Pierre¹ ; Alzuaga, Sebastien¹ ; Catherinot, Lise³ ; Chatras, Matthieu³ ; Ballandras, Sylvain¹
¹FEMTO-ST (FRANCE); ²SENSeOR SAS (FRANCE); ³Xlim (FRANCE)
- 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)
- 17:50 Topology Dependence of Mass Sensitivities in Mode Localized Sensors
Thiruvengathan, Pradyumna ; Yan, Jize ; Seshia, Ashwin
University of Cambridge (UNITED KINGDOM)

Session 6 - T&F Transfer through Optical Fibers

- 16:10 Multiplexed Optical Link for Ultra-Stable Frequency Dissemination
Amy-Klein, Anne¹ ; Lopez, Olivier² ; Jiang, Haifeng³ ; Chanteau, Bruno² ; Haboucha, Adil³ ; Roncin, Vincent² ; Kéfélian, Fabien² ; Chardonnet, Christian² ; Santarelli, Giorgio³
¹Université Paris 13 (FRANCE); ²LPL - CNRS - UP13 (FRANCE); ³LNE-SYRTE - CNRS - UPMC - Obs de Paris (FRANCE)
- 16:30 Long Haul Frequency Transfer between MPQ and PTB using a Telecommunication Fiber Link of 900 km Length
Predehl, Katharina¹ ; Udem, Thomas¹ ; Alnis, Janis¹ ; Ronald, Holzwarth¹ ; Terra, Osama² ; Grosche, Gesine² ; Schnatz, Harald² ; Hänsch, Theodor W.¹
¹Max-Planck-Institute of Quantum Optics (GERMANY); ²Physikalisch-Technische Bundesanstalt (GERMANY)
- 16:50 Fiber Based One Way Time Transfer with Enhanced Accuracy
Ebenhag, Sven-Christian ; Hedekvist, Per Olof
SP Technical Research Institute of Sweden (SWEDEN)
- 17:10 Time Transfer Through Optical Fibers: Progress on Calibrated Clock Comparisons
Rost, Michael¹ ; Fujieda, Miho² ; Piester, Dirk¹
¹Physikalisch-Technische Bundesanstalt, Braunschweig (GERMANY); ²National Institute of Information and Communications Technology, Tokyo (JAPAN)
- 17:30 Dissemination of Frequency References to Many Locations Along an Optical Telecommunication Fiber
Grosche, Gesine
Physikalisch-Technische Bundesanstalt (GERMANY)

- 17:50 Time Transfer Using Fiber Links
Smotlacha, Vladimir¹; Kuna, Alexander²; Mache, Werner³
¹CESNET (CZECH REPUBLIC); ²Institute of Photonics and Electronics, AS CR, v.v.i., Prague
 (CZECH REPUBLIC); ³Bundesamt für Eich - und Vermessungswesen, Vienna (AUSTRIA)

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, Ivan¹; Kodet, Jan¹; Blazej, Josef¹; Schreiber, Ulrich²; Cacciapuoti, Luigi³
¹Czech Technical University in Prague (CZECH REPUBLIC); ²Technische Universitaet Muenchen (GERMANY); ³European Space Agency, ESA (NETHERLANDS)
- 09:20 Time Transfer by Laser Link - T2L2: Current Status of the Validation Program
SAMAIN, Etienne¹; GUILLEMOT, Philippe²; EXERTIER, Pierre¹; PIERRON, Francis¹; ALABANESE, Dominique¹; PARIS, Jocelyn¹; TORRE, Jean-Marie¹; LEON, Sylvie²
¹OCA (FRANCE); ²CNES (FRANCE)
- 09:40 A Coherent Optical Link through the Turbulent Atmosphere: Context and Applications
Wolf, Peter¹; Acef, Ouali¹; Clairon, André¹; Djerroud, Khelifa¹; Lemonde, Pierre¹; Man, Catherine²; Samain, Etienne³
¹LNE-SYRTE, Observatoire de Paris, CNRS, UPMC (FRANCE); ²ARTEMIS, Observatoire de la Côte d'Azur, CNRS (FRANCE); ³GéoAzur, Observatoire de la Côte d'Azur, CNRS (FRANCE)
- 10:00 VLBI Time-Transfer using CONT08 Data
Rieck, Carsten¹; Haas, Rüdiger²; Jaldehag, Kenneth³; Johansson, Jan¹
¹SP / Chalmers / OSO (SWEDEN); ²Chalmers University of Technology, Onsala Space Observatory (SWEDEN); ³SP Technical Research Institute of Sweden (SWEDEN)
- 10:20 Millisecond Pulsars to Transfer the Accuracy of Atomic Time
Petit, Gérard¹; Cognard, Ismaël²
¹BIPM, 92312 Sèvres (FRANCE); ²LCP2E/CNRS 45071 Orléans (FRANCE)

Session 8 - RF Acousto-electronic

- 09:20 A 2D Transducer Structure for the Excitation of Surface Acoustic Wave
Daniau, William¹; Baron, Thomas²; Garcia, Julien¹; Laroche, Thierry¹; Ballandras, Sylvain³
¹CNRS (FRANCE); ²ENSMM (FRANCE); ³CNRS/SENSeOR (FRANCE)

- 09:40 Large Bandpass Filter Synthesis using Shear-Wave Lithium Niobate Piezoelectric Layers
Rigaudeau, Laetitia¹; Monfraix, Philippe²; Ballandras, Sylvain³; Baron, Thomas³; Chatras, Matthieu⁴; Bila, Stéphane⁴; Cros, Dominique⁴
¹CNES (FRANCE); ²Thalès Alenia Space (FRANCE); ³Femto ST (FRANCE); ⁴Xlim Research Institute, University of Limoges (FRANCE)
- 10:00 Fabrication of a 3 GHZ Oscillator based on NANO-Carbon-DIAMOND-FILM-BASED Guided Wave Resonators
Salut, Roland¹; Gesset, Céline²; Martin, Gilles¹; Saada, Samuel²; Assouar, Badreddine³; Bergonzo, Philippe²; Boudot, Rodolphe¹; Bénédict, Fabien⁴; Elmazria, Omar³; Omnes, Franck⁵; Rémiens, Denis⁶; Ballandras, Sylvain⁷
¹CNRS (FRANCE); ²CEA-LIST (FRANCE); ³CNRS-IJL (FRANCE); ⁴CNRS-LIMHP (FRANCE); ⁵CNRS-Inst. Néel (FRANCE); ⁶IEMN (FRANCE); ⁷CNRS/SENSeOR (FRANCE)
- 10:40 Micromachined Thin film Plate Acoustic Resonators (FPAR): Theory and Applications
Yantchev, Ventsislav ; Katardjiev, Ilia
Uppsala University (SWEDEN)
- 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
Emilia, Nunzi ; Saltanocchi, Giorgio
University of Perugia (ITALY)
- 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
LNE-SYRTE, Observatoire de Paris, LNE, CNRS, UPMC (FRANCE)
- 12:20 Results from NPL's Clock Ensemble Algorithm
Shemar, Setnam ; Davis, John A. ; Whibberley, Peter B.
National Physical Laboratory (UNITED KINGDOM)
- 12:40 Master Clock for Real Time Realization UTC(SU) Paper Clock
Koshelyaevsky, N. ; Pentin, S.
Division of Time Standard, VNIIFTRI (RUSSIAN FEDERATION)

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
SYRTE - Observatoire de Paris (FRANCE)
- 11:40 Development of an Ultra-Stable Monocrystalline Silicon Resonator for Optical Clocks
Kessler, Thomas ¹; Hagemann, Christian ¹; Sterr, Uwe ¹; Riehle, Fritz ¹; Martin, Michael J. ²; Ye, Jun ²
¹Physikalisch Technische Bundesanstalt (GERMANY); ²JILA, NIST and University of Colorado (UNITED STATES)
- 12:00 Diode Laser Systems for Precision Measurement Applications on Earth and in Space
Peters, Achim ¹; Wicht, Andreas ²
¹Humboldt-Universitaet Berlin + FBH (GERMANY); ²Ferdinand-Braun-Institut / Leibniz Institut fuer Hoechstfrequenztechnik (FBH) (GERMANY)
- 12:20 The Space Optical Clocks (SOC) Project: Status and Perspectives
Tino, Guglielmo ¹; Sterr, U. ²; Görlitz, A. ³; Lemonde, P. ⁴; Salomon, C. ⁵; Schiller, S. ³
¹Universita' di Firenze (ITALY); ²Physikalisch-Technische Bundesanstalt Braunschweig (GERMANY);
³Heinrich-Heine-Universität Düsseldorf (GERMANY); ⁴LNE-SYRTE (FRANCE);
⁵Ecole Normale Supérieure Paris (FRANCE)
- 12:40 The Space Time Asymmetry Research (STAR) Program
Braxmaier, Claus ¹; Schuldt, Thilo ¹; Allab, Mohammed ¹; von Zoest, Tim ²; Theil, Stephan ²; Pelivan, Ivanka ²; Herrmann, Sven ³; Lämmerzahl, Claus ³; Peters, Achim ⁴; Möhle, Katharina ⁴; Wicht, Andreas ⁴; Nagel, Moritz ⁴; Kovalchuk, Evgeny ⁴; Döringshoff, Klaus ⁴; Dittus, Hansjörg ³
¹University of Applied Sciences Konstanz (GERMANY); ²DLR Bremen (GERMANY);
³ZARM University Bremen (GERMANY); ⁴Humboldt-University Berlin (GERMANY)
- 13:00 Lunch break

Session 11 - Microwave Clocks

- 14:00 Invited Presentation-Giant Coherence Times in a Trapped Atom Microwave Clock
Rosenbusch, Peter ¹; Ramirez-Martinez, Fernando ¹; Deutsch, Christian ²; Lacroute, Clement ¹; Reinhard, Friedemann ²; Schneider, Tobias ²; Reichel, Jakob ²
¹LNE-SYRTE (FRANCE); ²ENS, LKB (FRANCE)
- 14:40 Realisation of a Compact Laser-Pumped Rubidium Frequency Standard with $< 1 \times 10^{-12}$ Stability at 1 Second
Affolderbach, Christoph ¹; Gruet, Florian ²; Matthey, Renaud ²; Miletì, Gaetano ²
¹Université de Neuchâtel (SWITZERLAND); ²Université de Neuchâtel - LTF (SWITZERLAND)

- 15:00 Testing Fundamental Physics by Searching the Derivative of the Comparison Frequency Between a CSO and a H-Maser
*Tobar, Michael*¹; *Wolf, Peter*²; *Bize, Sebastien*²; *Santarelli, Giorgio*²; *Flambaum, Victor*³
¹University of Western Australia (AUSTRALIA); ²LNE-SYRTE, Observatoire de Paris, CNRS, UPMC (FRANCE); ³School of Physics, The University of New South Wales (AUSTRALIA)

Session 12 - Calibration

- 14:00 Toward an Unified TWSTFT and GNSS Calibration for UTC Time Transfer
Jiang, Z. ; *Arias, E.F.* ; *Lewandowski, W.* ; *Petit, G.*
 Bureau International des Poids et Mesures (BIPM) (FRANCE)
- 14:20 Time Stability, Electrical Delay and Temperature Sensitivity of Dual Frequency GPS Receivers
*Proia, Amandine*¹; *Cibiel, Gilles*¹; *Yaigre, Leslie*²
¹CNES (FRANCE); ²Sogethi High-Tech (FRANCE)
- 14:40 On Improved GPS-Based Calibration of the Time Links between METAS and PTB
*Feldmann, Thorsten*¹; *Bauch, Andreas*¹; *Piester, Dirk*¹; *Stefanov, André*²; *Bernier, Laurent-Guy*²; *Schlunegger, Christian*²; *Liang, Kun*³
¹Physikalisch-Technische Bundesanstalt (PTB) (GERMANY); ²Bundesamt für Metrologie (METAS) (SWITZERLAND); ³National Institute of Metrology (NIM) (CHINA)
- 15:40 Coffee break

Poster Session I

16:10-18:00

- A 2D Model for Bulk Acoustic Wave Devices using a Dyadic Green's Function of Laminar Plates
*Ballandras, Sylvain*¹; *Daniau, William*²; *Garcia, Julien*²; *Laroche, Thierry*²; *Reinhardt, Alexandre*³
¹CNRS/SENSeOR (FRANCE); ²CNRS (FRANCE); ³CEA-LETI (FRANCE)

Dual-Mode Quartz Resonators Suitable for TCXO and OCXO
Kosykh, Anatoly ; *Khomenko, Igor*
 Omsk State technical university (RUSSIAN FEDERATION)

Modification of the Intrinsic Properties of Gaas, Gaph and Sic Samples under Light at Cryogenic Temperatures
*Mouneyrac, David*¹; *Hartnett, John G.*²; *Le Floch, Jean-Michel*²; *Krupka, Jerzy*³; *Cros, Dominique*¹;
*Tobar, Michael E.*²
¹XLIM (FRANCE); ²FSM (AUSTRALIA); ³Institute of Microelectronics and Optoelectronics (POLAND)

Langasite Resonant Structures: Fabrication and Characterization
*Leblois, Therese*¹; *Le Traon, Olivier*²
¹FEMTO-ST Institute (FRANCE); ²ONERA (FRANCE)

Coupled Modes in Plano-Convex Bulk Acoustic Wave Quartz Resonators
Imbaud, Joël ; Dulmet, Bernard ; Bourquin, Roger
FEMTO-ST (FRANCE)

Resonator Frequency Stability Contribution to the Performance of Ultrastable Oscillators
Before and After Integration
*Salzenstein, Patrice¹; Kuna, Alexander²; Sojdr, Ludvík²; Cemusova, Blanka²; Franquet, Nathalie¹;
Lefebvre, Frédéric³*
¹CNRS - FEMTO-ST (FRANCE); ²IPE - Czech Academy of Sciences (CZECH REPUBLIC);
³Oscilloquartz
S.A. (SWITZERLAND)

Miniature High-End Space Grade Ocxo
Canzian, Patrice ; Schneller, Luc ; Trialoup, Claude ; Candelier, Vincent ; Lamboley, Jacques
Rakon (FRANCE)

New State of the Art of Thermal Sensitivity with Space Ultra Stable Quartz Crystal Oscillator
Schneller, Luc¹; Canzian, Patrice¹; Candelier, Vincent¹; Galliou, Serge²; Cibié, Gilles³
¹Rakon (FRANCE); ²Femto-ST (FRANCE); ³CNES (FRANCE)

A New Ultrahigh Resolution Comparison Approach between Frequency Standards
Zhao, Jie ; Zhou, Wei ; Chen, Faxi ; Li, Hong ; Ding, Ning ; Zou, Chengzhi
Xidian University (CHINA)

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)

Correction of Elastic, Piezoelectric and Dielectric Constants of Ndca4o(BO3)3 Crystal using
Measured SAW Parameters
Brzozowski, Ernest ; Soluch, Waldemar
Institute of Electronic Materials Technology (POLAND)

Development of a Compact Yb Optical Lattice Clock
*Görlitz, Axel ; Abou-Jaoudeh, Charbel ; Bruni, Cristian ; Ernsting, Ingo ; Nevsky, Alexander ;
Schiller, Stephan*
University of Düsseldorf (GERMANY)

Dark-Resonance in Wall-Coated Cell for Rb-Clocks
Breschi, Evelina ; Miletì, Gaetano
University of Neuchâtel (SWITZERLAND)

Fabrication and Spectroscopy of Cs Vapour Cells with Buffer Gas for Miniature Atomic Clock
*Miletic, Danijela*¹; *Affolderbach, Christoph*¹; *Breschi, Evelina*¹; *Schori, Christian*¹; *Mileti, Gaetano*¹; *Hasegawa, Madoka*²; *Chutani, Ravinder*²; *Dziuban, Piotr*²; *Boudot, Rodolphe*²; *Giordano, Vincent*²; *Gorecki, Christophe*²

¹University of Neuchâtel (SWITZERLAND); ²FEMTO-ST (FRANCE)

Development of Passive Hydrogen Maser in Shanghai

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

Shanghai Astronomical Observatory (CHINA)

100 Mhz Line Width in a Neutral Atom Microwave Clock

*Deutsch, Christian*¹; *Ramirez-Martinez, Fernando*²; *Lacroute, Clement*²; *Reinhard, Friedemann*¹;

*Schneider, Tobias*¹; *Reichel, Jakob*¹; *Rosenbusch, Peter*²

¹ENS, LKB (FRANCE); ²LNE-SYRTE (FRANCE)

Investigating $\Delta m = \pm 1$ Transitions in an Atomic Fountain Clock

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

Physikalisch-Technische Bundesanstalt (GERMANY)

Pulsed Optically Pumped Rb Clock with Optical Detection: First Results

*Micalizio, Salvatore*¹; *Godone, Aldo*¹; *Levi, Filippo*¹; *Calosso, Claudio*¹; *Bandi, Thejesh*²; *Pellaton, Matthieu*²; *Gruet, Florian*²; *Affolderbach, Christoph*²; *Mileti, Gaetano*²

¹Istituto Nazionale di Ricerca Metrologica, INRIM (ITALY); ²Laboratoire Temps – Fréquence (LTF),

Université de Neuchâtel (SWITZERLAND)

Study of Rb 0-0 Hyperfine Double-Resonance Transition in a Wall-Coated Cell

Bandi, Thejesh ; *Affolderbach, Christoph* ; *Mileti, Gaetano*

Laboratoire Temps-Fréquence, University of Neuchatel (SWITZERLAND)

Stark Shift of the Cs Clock Transition Frequency: a CPT-Pump-Probe Approach

Robyr, Jean-Luc ; *Knowles, Paul* ; *Weis, Antoine*

University of Fribourg (SWITZERLAND)

Low Temperature Indium-based Sealing of Microfabricated Alkali Cells for Chip Scale Atomic Clocks

*Pétremand, Yves*¹; *Schori, Christian*²; *Straessle, Rahel*¹; *Mileti, Gaetano*²; *de Rooij, Nico*¹; *Thomann, Pierre*²

¹Ecole Polytechnique Fédérale de Lausanne (EPFL) (SWITZERLAND); ²LTF, University of Neuchatel (SWITZERLAND)

Measurements of Cs-buffer Gas Collisional Frequency Shift using CPT Interrogation

*Kozlova, Olga*¹; *Boudot, Rodolphe*²; *Guérandel, Stéphane*¹; *De Clercq, Emeric*¹

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

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)

Cs Fountain VNIIFTRI

D0mnin, Yury ; Baryshev, V. ; Boyko, A. ; Elkin, G. ; Kopylov, L. ; Krasovskiy, P. ; Novoselov, A.
FGUP VNIIFTRI (RUSSIAN FEDERATION)

The Compensation and Processing Techniques used for Rubidium Frequency Standards

Zhou, Wei ; Ding, Ning ; Zou, Chengzhi ; Li, Hong
Xidian University (CHINA)

FM Spectroscopy of Nonlinear Magneto-Optical Resonances

Baryshev, Viacheslav
FGUP VNIIFTRI (RUSSIAN FEDERATION)

CPT Atomic Clock based on Rubidium 85

Schori, C. ¹; Miletì, G. ^{1, 2}; Leuenberger, B. ²; Rochat, P. ²
¹University Neuchâtel, Time- Frequency Laboratory (LTF) (SWITZERLAND); ²SpectraTime (SWITZERLAND)

Recent Progress on Superconducting Cavity for Frequency Standard in China

Wang, Nuanrang
Beijing Institute of Radio Metrology & Measurement (CHINA)

Study on a High Q Sapphire Loaded Microwave Cavity for Compact Hydrogen Maser

Wang, Nuanrang
Beijing Institute of Radio Metrology & Measurement (CHINA)

Carrier Suppression of Phase Modulated Beam using Optical Cavity for CPT Clock

Choi, In Ho ¹; Lee, Sang-Bum ²; Kwon, Taeg Yong ²; Park, Sang Eon ²
¹KAIST, KRISS (KOREA, REPUBLIC OF); ²KRISS (KOREA, REPUBLIC OF)

New Design Toward a Miniature Atomic Clock using a Σ^+ - Σ^- CPT Configuration

Haesler, Jacques ; Lecomte, Steve
Centre Suisse d'Electronique et de Microtechnique (CSEM) SA (SWITZERLAND)

Narrow Linewidth Lasers for a Strontium Optical Lattice Clock

Bridge, Elizabeth M. ¹; Hill, Ian R. ²; Barwood, Geoffrey P. ³; Curtis, E. Anne ²; Gill, Patrick ⁴
¹National Physical Laboratory and University of Oxford (UNITED KINGDOM); ²National Physical Laboratory and Imperial College London (UNITED KINGDOM); ³National Physical Laboratory (UNITED KINGDOM);
⁴National Physical Laboratory, University of Oxford and Imperial College London (UNITED KINGDOM)

Towards an Optical Frequency Standard Based on Lattice-Confined Neutral Magnesium Atoms

*Pape, Andre*¹; *Friebe, Jan*¹; *Riedmann, Matthias*¹; *Terra, Osama*²; *Wuebbena, Temmo*¹; *Kulosa, Andre*¹; *Kelkar, Hrishikesh*¹; *Amairi, Sana*¹; *Predehl, Katharina*²; *Feldmann, Thorsten*²; *Legero, Thomas*²;
*Lipphardt, Burghard*²; *Grosche, Gesine*²; *Schnatz, Harald*²; *Ertmer, Wolfgang*¹; *Rasel, Ernst-Maria*¹

¹*Institute of Quantum Optics (GERMANY);* ²*Physikalisch-Technische Bundesanstalt (GERMANY)*

Development of a Transportable Laser Cooled Strontium Source for Future Applications in Space

*Schioppo, Marco*¹; *Tino, G.M.*¹; *Polì, N.*¹; *Tarallo, M.G.*¹; *Sutyryn, D.V.*¹; *Prevedelli, M.*¹; *Sorrentino, F.*¹; *Lisdat, Ch.*²; *Vellore Winfred, J.S.R.*²; *Falke, S.*²; *Sterr, U.*²; *Legero, T.*²; *Riehle, F.*²; *Cacciapuotì, L.*³

¹*Università di Firenze, Dipartimento di fisica, European Laboratory for Non-Linear Spectroscopy (ITALY);*

²*Physikalisch-Technische Bundesanstalt Braunschweig (GERMANY);* ³*ESA (NETHERLANDS)*

The ACES GNSS Subsystem and its Applications

*Hess, Marc Peter*¹; *Helm, Achim*¹; *Cacciapuotì, Luigi*²; *Feltham, Stephen*²; *Much, Rudolf*²; *Nasca, Rosario*²; *Montenbruck, Oliver*³; *Gribkov, Alexander*⁴

¹*Astrium Space Transportation (GERMANY);* ²*European Space Agency (NETHERLANDS);*

³*DLR/GSOC (GERMANY);* ⁴*JAVAD GNSS (RUSSIAN FEDERATION)*

GGTO and UTC Dissemination Results in GIOVE-Mission

*Mudrak, Alexander*¹; *Gaetano, Galluzzo*²

¹*ESA (NETHERLANDS);* ²*VEGA (NETHERLANDS)*

On Site Activities of the Galileo Precise Timing Facility

*Zanella, Renzo*¹; *Piras, Chiara*²; *Samperi, Andrea*²; *Detoma, Edoardo*³; *Capetti, Paola*³; *Ferrato, Andrea*⁴; *Villabruna, Diego*⁴; *Mudrak, Alexander*⁵

¹*ThalesAleniaSpace Italia (ITALY);* ²*SSE (ITALY);* ³*SEPA (ITALY);* ⁴*AleniaSIA (ITALY);*

⁵*ESA (NETHERLANDS)*

Aircraft High Dynamic Two-Way Time Synchronization Technique Research

*Ma, Hong-Jiao*¹; *He, Zai-Min*²; *Wu, Jian-Feng*¹; *Wang, Ji-Gang*¹; *Wang, Kang*¹

¹*National Time Service Center, Chinese Academy of Sciences (CHINA);* ²*Graduate University of Chinese Academy of Sciences (CHINA)*

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)

Timing Accuracy Analysis using Height as Virtual Satellite

shan, qingxiao; *yueke, wang*; *jun, yang*; *jianyun, chen*

national university of defense technology (CHINA)

Improvement Method of the Timing Accuracy by using Legacy Loran Signal

*Yang, Sung-hoon*¹; *Lee, Chang Bok*¹; *Lee, Sang Jeong*²; *Kim, Young Jae*¹; *Lee, Jong Ku*¹

¹*KRISS (KOREA, REPUBLIC OF);* ²*CNU (KOREA, REPUBLIC OF)*

Monitoring and Prediction of GNSS System Time Difference
Zhang, Huijun ; Li, Xiaohui
National Time Service Center (CHINA)

Report on Progress of Multi-System Time Transfer at the AOS
Nawrocki, Jerzy ; Nogas, Pawel
Space Research Centre (POLAND)

GEOSTAR: a Proposal for Global Earth and In-Orbit Synchronisation of Time Atomic References
Dimarcq, Noel¹ ; Samain, Etienne² ; Léger, Benoît³
¹CNRS-Paris Observatory (FRANCE); ²Observatoire de la Côte d'Azur - Geosciences Azur (FRANCE);
³CNES (FRANCE)

Simulation of Servo Loops in Atomic Clock Ensemble in Space (ACES)
Dam, Joydeep Kumar¹ ; Schaefer, Wolfgang¹ ; Hejc, Gerhard¹ ; Hess, Marc-Peter² ; Stringhetti, Luca² ;
Kehrer, Johannes² ; Cacciapuoti, Luigi³
¹TimeTech GmbH (GERMANY); ²EADS Astrium (GERMANY); ³ESA (NETHERLANDS)

Satellite Navigation Augmentation Technology Based on Digital Video Broadcasting Signal
Song, Kexin ; Wu, Haitao ; Hua, Yu ; Guo, Wei
National Time Service Center, Chinese Academy of Science (CHINA)

The Research and Application of Measuring Pseudo Distance with DTV Signal in Navigation
Song, Kexin ; Hua, Yu ; Xiang, Yu ; Li, Shifeng
National Time Service Center, Chinese Academy of Science (CHINA)

Optical Frequency Dissemination over a German Wide-Area Telecommunication Network
Terra, Osama (Presenting)¹ ; Grosche, Gesine¹ ; Predehl, Katharina² ; Holzwarth, Ronald³ ; Schnatz, Harald¹
¹Physikalisch-Technische Bundesanstalt, Braunschweig (GERMANY); ²Max Planck Institute for Quantum Optics (GERMANY); ³Max Planck Institute for Quantum Optics, Garching (GERMANY)

An Ultra Stable Event Timer Designed for T2L2
Samain, Etienne¹ ; Fridelance, Patricia² ; Guillemot, Philippe³
¹OCA (FRANCE); ²Phusipus Integration (FRANCE); ³CNES (FRANCE)

A Novel Synchronization Method by Simulated Gps Radio Signal
Shan, Qingxiao ; Wang, Yueke ; Yang, Jun ; Chen, Jianyun
National University of Defense Technology (CHINA)

Restore the TWSTFT Calibration with a GPS Bridge - A Standard Procedure for UTC Time Transfer
Jiang, Zhiheng¹ ; Piester, D.² ; Liang, K.³
¹Bureau International des Poids et Mesures (BIPM) (FRANCE); ²Physikalisch-Technische Bundesanstalt (GERMANY); ³National Institute of Metrology (CHINA)

A Short Time Measurement Based on Length Vernier

Miao, Miao

Xidian University (CHINA)

Performance Evaluation of NIM GPS Receivers in use for Time Transfer with PTB

Liang, Kun¹; Feldmann, Thorsten²; Bauch, Andreas²; Piester, Dirk²; Zhang, Aimin¹; Gao, Xiaoxun¹

¹National Institute of Metrology (NIM) (CHINA); ²Physikalisch-Technische Bundesanstalt (PTB) (GERMANY)

A Model of Joint Time Keeping with Hydrogen Masers and Cesium Clocks

Yuan, Haibo ; Dong, Shaowu ; Qu, Lili

National Time Service Center, Chinese Academy of Sciences (CHINA)

19:00-22:00 Conference Dinner

Thursday, 15 April 2010

Session 13 - T&F Transfer

09:00 Invited Presentation-Use of GPS Precise Point Positioning for TAI

Petit, Gérard

BIPM (FRANCE)

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)

10:00 Long-term Inconsistency of TWSTFT and GPS Time Transfers Results In PTB-TL and NICT-TL Time Links

Lin, Calvin. S.Y.¹; Feng, Kai-Ming²; Lin, Huang-Tien¹; Huang, Yi-Jiung¹

¹Telecommunication Labs (TAIWAN); ²National Tsing Hua University (TAIWAN)

10:20 Near-Real Time Synchronization through a Network of GnsS Receivers Located in Timing Laboratories

Cerretto, Giancarlo¹; Perucca, Andrea²; Tavella, Patrizia²; Píriz, Ricardo³

¹INRIM - Politecnico di Torino (DISPEA) (ITALY); ²INRIM (ITALY); ³GMV (SPAIN)

Session 14 - Oscillators and Noise

09:00 A Cryogenic Sapphire Oscillator Based on an Ultra-Low Vibration Custom-Designed Cryostat and a Pulse-Tube Cryocooler

Hartnett, John¹; Nand, Nitin¹; Wang, Chao²; Le Floch, Jean-Michel¹

¹University of Western Australia (AUSTRALIA); ²Cryomech, Inc. (UNITED STATES)

09:20 Demonstration of a Cryocooled 10 GHz Oscillator with 1e-15 Frequency Stability
Grop, Serge¹; Bourgeois, Pierre Yves¹; Bazin, Nicolas¹; Kersalé, Yann¹; Rubiola, Enrico¹; Langham, Conway²; Oxborrow, Mark²; De Vicente, Javier³; Giordano, Vincent¹

¹Institut FEMTO-ST (FRANCE); ²National Physical Laboratory (UNITED KINGDOM);

³European Space Agency (GERMANY)

09:40 D.C.-Powered Fe3+: Sapphire Maser Oscillator
*Oxborrow, Mark*¹; *Bourgeois, Pierre-Yves*²; *Kersalé, Yann*²; *Giordano, Vincent*²
¹NPL (UNITED KINGDOM); ²Institut FEMTO-ST (FRANCE)

10:00 Cross Correlation Residual Phase Noise Measurements using Two HP3048-B
Systems and a
PC Based FFT Spectrum Analyser
*Everard, Jeremy*¹; *Bale, Simon*¹; *Wakley, Brett*²
¹University of York (UNITED KINGDOM); ²Formerly University of York (UNITED
KINGDOM)

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*¹; *Droz, Fabien*²; *Resti, Alberto*³; *Mosset, Pierre*²; *Ostilio,*
*Alessandra*³; *Beretta, Simone*¹; *Gioia, Marina*¹; *Waller, Pierre*³; *Qinghua, Wang*²;
*Rochat, Pascal*²
¹Selex Galileo (ITALY); ²SpectraTime (SWITZERLAND); ³ESA (NETHERLANDS)

12:00 A Simulation of the Effect of Improved Ground Clocks on GPS Timing Performance
*Suess, Matthias*¹; *Matsakis, Demetrios*²
¹German Aerospace Center (GERMANY); ²U.S. Naval Observatory (UNITED
STATES)

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.*¹; *Hugentobler, Urs*²; *Voithenleitner, Dominik*²; *Markus, Heinze*²;
*Klein, Volker*¹; *Kemmerle, Kurt*¹; *Bedrich, Stefan*¹
¹Kayser-Threde GmbH (GERMANY); ²Technische Universitaet Muenchen
(GERMANY)

Session 16 - Frequency Combs

- 11:20 Invited Presentation-First Fully Stabilized Frequency Comb from a SESAM-Modelocked 1.5- μm Solid-State Oscillator
*Stumpf, Max C.*¹; *Pekarek, Selina*¹; *Oehler, Andreas E. H.*¹; *Südmeyer, Thomas*¹; *Dudley, John M.*²; *Keller, Ursula*¹
¹ETH Zurich (SWITZERLAND); ²Université de Franche-Comté (FRANCE)
- 12:00 Ultra-Low Noise Microwave Extraction from Fiber-Based Optical Frequency Comb
*Zhang, Wei*¹; *Xu, Z.*²; *Millo, J.*¹; *Boudot, R.*²; *Lours, M.*¹; *Bourgeois, P. Y.*²; *Luiten, A. N.*³; *Le Coq, Y.*¹; *Kersalé, Y.*²; *Santarelli, G.*¹
¹LNE-SYRTE, Observatoire de Paris, CNRS, UPMC (FRANCE); ²FEMTO-ST Institute, CNRS and ENSMM, Besançon (FRANCE); ³School of Physics, University of Western Australia (AUSTRALIA)
- 12:20 Optical Frequency Combs and Applications at NPL
*Margolis, Helen*¹; *Marra, Giuseppe*¹; *Tsatourian, Veronika*¹; *Walton, Barney*¹; *Lea, Stephen*¹; *Reid, Derryck*²; *Gill, Patrick*¹
¹National Physical Laboratory (UNITED KINGDOM); ²Heriot-Watt University (UNITED KINGDOM)
- 12:40 Octave-Spanning Tunable Frequency Combs on a Chip
*Holzwarth, Ronald*¹; *Del'Haye, P.*¹; *Herr, T.*¹; *Gavartin, E.*²; *Kippenberg, T.J.*²
¹Menlo Systems GmbH (GERMANY); ²Ecole Polytechnique Fédérale de Lausanne (EPFL) (SWITZERLAND)

13:00 *Lunch break*

Poster Session II

14:00-15:40

Multi-channel Real-time Computation of ADEV and TDEV

Kasznia, Michal

Poznan University of Technology (POLAND)

Joint Real-Time Computation of Allan Deviation, Time Deviation, and Hadamard Deviation

Dobrogowski, Andrzej; *Kasznia, Michal*

Poznan University of Technology (POLAND)

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*

Poznan University of Technology (POLAND)

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)

Thermal Sensitivity of a DMTD used in a Composite Clock

Plantard, Cédric ; Vernotte, François ; Meyer, Eric
Observatoire de Besançon (FRANCE)

A Time Interval Measurement for Satellite Time Standard Assembly

shi, shao-hua¹; li, xiao-hui²; zhang, hui-jun²; zhao, zhi-xiong²

¹Graduate University of the Chinese Academy of Sciences (CHINA); ²National Time Service Center (CHINA)

Low Noise Beat Frequency Measurements of Low Power Signals

Creedon, Daniel ; Tobar, Michael ; Ivanov, Eugene ; Hartnett, John
University of Western Australia (AUSTRALIA)

Low Phase Noise Frequency Synthesizer for Satellite Communication Systems

Bolucek, Muhsin
TUBITAK-UZAY (TURKEY)

An Algorithm for Automating Fast and Accurate Measurements of the Resonance Frequencies

Droit, christophe¹; Friedt, Jean-Michel¹; Ballandras, Sylvain²; Martin, Gilles²

¹SENSeOR (FRANCE); ²Femto-st (FRANCE)

Heatproof Microwave Sensors. Flame Parameters Diagnostics in Combustion Chambers of the Different Engine Types

Safonova, Ekaterina ; Boloznev, Victor
Kazan State Technical University (RUSSIAN FEDERATION)

Phase Errors in Surface Acoustic Wave Devices under Rotation

Nikolaevtsev, Victor ; Suchkov, Sergey
Saratov State University (RUSSIAN FEDERATION)

The Progress of Strontium Optical Lattice Clock at NIM

Wang, Shao-Kai ; Wang, Qiang ; Li, Ye ; Lin, Yi-Ge ; Wang, Min-Ming ; Lin, Bai-Ke ; Zhao, Yang ;

Zang, Er-Jun ; Li, Tian-Chu ; Fang, Zhan-Jun
National Institute of Metrology of China (CHINA)

Quantum Sensors with Cold Ions

Mehlstäubler, Tanja ; Pyka, Karsten ; Herschbach, Norbert
PTB (GERMANY)

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)

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)

Tackling the Black Body Shift in a Strontium Optical Lattice Clock

Falke, Stephan ; Middelmann, Thomas ; Lisdat, Christian ; Vellore Winfred, Joseph Sundar Raaj ; Riehle, Fritz ; Sterr, Uwe
Physikalisch-Technische Bundesanstalt (GERMANY)

Towards a Portable Aluminum Optical Clock

Schmidt, Piet ; Mandel, Olaf ; Sherstov, Ivan
PTB Braunschweig and Leibniz University of Hannover (GERMANY)

A Clock Laser with High Frequency Stability and Highly Precise Transfer

Li, Ying ; Nagano, Shigeo ; Matsubara, Kensuke ; Ito, Hiroyuki ; Kajita, masatoshi ; Hosokawa, Mizuhiko
National Institute of Information and Communication Technology (JAPAN)

Determining a Limit on the Variation of the Fine Structure Constant through Optical Frequency Measurements

in $^{171}\text{Yb}^+$

Godun, Rachel ; Webster, S.A. ; King, S.A. ; Huang, G. ; Walton, B.R. ; Tsaturian, V. ; Margolis, H.S. ; Lea, S.N. ; Gill, P.
National Physical Laboratory (UNITED KINGDOM)

Transportable Cavity-Stabilized Fiber Laser

Legero, Thomas ¹ ; Kessler, Thomas ² ; Grosche, Gesine ¹ ; Sterr, Uwe ² ; Schnatz, Harald ¹
¹Physikalisch-Technische Bundesanstalt (GERMANY); ²Physikalisch-Technische Bundesanstalt and Centre for Quantum Engineering and Space-Time Research (GERMANY)

Low Noise Optical Link Development at INRIM

Mura, Alberto ¹ ; Bastida, Karina ² ; Levi, Filippo ¹ ; Calonico, Davide ¹ ; Lorini, Luca ¹ ; Costanzo, Giovanni Antonio ³ ; Godone, Aldo ¹
¹INRIM (ITALY); ²INTI (ARGENTINA); ³Politecnico di Torino (ITALY)

Development of an Yb Optical Lattice Clock at KRISS

Yu, Dai-Hyuk ; Park, Chang Yong ; Lee, Won-Kyu ; Kim, Eok Bong ; Mun, Jongchul
Korea Research Institute of Standards and Science (KOREA, REPUBLIC OF)

Stable Narrow Linewidth 689nm ECDL for the Second Stage Cooling of Strontium Atoms

LI, Ye ¹ ; LIN, YiGe ¹ ; YANG, Tao ² ; CAO, JianPing ¹ ; FANG, ZhanJun ¹ ; ZANG, ErJun ¹
¹National Institute of Metrology (CHINA); ²Beijing Institute of Technology (CHINA)

Thermal Design of a High-Finesse Cavity Enclosure for an Ultra-Stable Laser

Dolgovski, Vladimir ; Schilt, Stephane ; Di Domenico, Gianni ; Hofstetter, Daniel ; Thomann, Pierre
University of Neuchâtel, Time and Frequency Laboratory (SWITZERLAND)

Demonstration of an Optical Frequency Synthesizer with Zero Offset Frequency Stabilization by the Direct Locking Method

Eok Bong, Kim¹; Jae-hwan, Lee²; Luu Tran, Trung²; Won-Kyu, Lee¹; Dai-Hyuk, Yu¹; Han Young, Ryu¹; Chang Hee, Nam²; Chang Yong, Park¹

¹Korea Research Institute of Standards and Science (REPUBLIC OF KOREA); ²Korea Advanced Institute of Science and Technology (REPUBLIC OF KOREA)

Frequency Dissemination with Free-Space Optical Links

Mata Calvo, Ramon ; Moll, Florian ; Knapek, Markus ; Giggenbach, Dirk
DLR - Deutsches Zentrum für Luft- und Raumfahrt (GERMANY)

Development of an Ultrastable Laser in the 1.5 μm Band for Cw Optical Frequency Transfer over Optical Fibre

Parker, Benjamin¹; Webster, Stephen¹; Lea, Stephen¹; Gill, Patrick¹; Bayvel, Polina²
¹National Physical Laboratory (UNITED KINGDOM); ²Department of Electronic and Electrical Engineering, University College London (UNITED KINGDOM)

Millimeter Atomic Clock Based on the Laser Induced Line Narrowing Effect

Litvinov, Andrey ; Kazakov, George ; Matisov, Boris
Saint-Petersburg State Polytechnic University (RUSSIAN FEDERATION)

Yb Lattice Clock at INRIM

Calonico, Davide¹; Levi, Filippo¹; Lorini, Luca¹; Costanzo, Giovanni Antonio²; Bertacco, Elio Keith¹;
Zoppi, Marco²; Godone, Aldo¹
¹Istituto Nazionale di Ricerca Metrologica INRIM (ITALY); ²Politecnico di Torino (ITALY)

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)

Simple Method for Measuring Frequency Noise of Optical Frequency Comb in Optical Domain

Park, Sang Eon ; Lee, Sang-Bum ; Kim, Eok Bong ; Kwon, Taeg Yong
KRISS (KOREA, REPUBLIC OF)

Characteristics of Microwave Signals Generated with Two Diode Lasers Injection-Locked to an Optical Frequency Comb

Lee, Sang-Bum ; Park, Sang Eon ; Kwon, Taeg Yong
Korea Research Institute of Standard and Science (KOREA, REPUBLIC OF)

Progress on the Development of Nd: YAG Laser Frequency Stabilized on Iodine Transition for Space Applications

Turazza, Oscar¹; Lours, michel²; Holleville, David³; Du Burck, Frederic⁴; Auger, Gérard⁵;
Brillet, Alain⁶; Clairon, andré²; Acef, Ouali²
¹SYRTE/APC/Observatoire de Paris (FRANCE); ²LNE-SYRTE / Observatoire de Paris/CNRS-UMR8630/UPMC-Paris 6 (FRANCE); ³LNE-SYRTE-Observatoire de Paris-CNRS (FRANCE); ⁴LPL / CNRS-UMR 7538 / Université Paris XIII (FRANCE); ⁵APC/ Observatoire de Paris/ Univ-Paris 7 (FRANCE); ⁶ARTEMIS / CNRS-UMR 6162/ Observatoire de la côte d'Azur (FRANCE)

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)*

Interactions Blackbody Radiation with Alkaline-Earth Atoms: Applications to Optical Frequency Standards on

Sr Atoms

Palchikov, Vitaly¹; Ovsiannikov, Vitaly²; Sluysarev, Sergey¹; Kostin, Aleksey¹

*¹FGUP VNIIFTRI (RUSSIAN FEDERATION); ²Department of Physics, Voronezh State University
(RUSSIAN FEDERATION)*

Development of a Dipole Lattice Trap for a Mercury Optical Lattice Clock

Yi, Lin ; Mejri, Sinda ; McFerran, John J. ; Bize, Sébastien

SYRTE, Observatoire de Paris (FRANCE)

Mini-DOLL (Deep Space Optical Lasesr Link): Experimental Setup and First Results

Djerroud, Khelifa¹; Acef, Ouali¹; Clairon, André¹; Lemonde, Pierre¹; Man, Catherine²; Samain, Etienne³; Wolf, Peter¹

¹LNE-SYRTE, Observatoire de Paris, CNRS, UPMC (FRANCE); ²ARTEMIS, Observatoire de la Côte d'Azur, CNRS (FRANCE); ³GéoAzur, Observatoire de la Côte d'Azur, CNRS (FRANCE)

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)*

Phase-Locking of A 2.7 Terahertz Quantum Cascade Laser to a Mode-Locked Er-Fiber Laser

Santarelli, Giorgio¹; Barbieri, Stefano²; Gellie, Pierre²; Ding, Lu²; Maineult, Wilfried²; Sirtori, Carlo²; Colombelli, Raffaele³; Beere, Harvey⁴; Ritchie, David⁴

¹LNE-SYRTE, Observatoire de Paris (FRANCE); ²MPQ, Université Paris 7 (FRANCE); ³IEF, Université Paris Sud (FRANCE); ⁴Cavendish Laboratory (UNITED KINGDOM)

Cold Atom Rotation Sensor

Berg, Peter ; Gilowski, Michael ; Schubert, Christian ; Tackmann, Gunnar ; Wendrich, Thijs ; Ertmer, Wolfgang ; Rasel, Ernst Maria

Institut für Quantenoptik, Leibniz Universität Hannover (GERMANY)

Interpolation of TW Time Transfer from Measured Points onto Standard MJD for UTC Generation

Jiang, Zhiheng

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

New Time Scale at the Royal Observatory of Belgium

Sharma, Suman ; Defraigne, Pascale

Royal Observatory of Belgium (BELGIUM)

Precise Point Positioning: Implementation of the Constrained Clock Model and Analysis of its Effects in

T/F Transfer

Cerretto, Giancarlo¹; Lahaye, François²; Tavella, Patrizia³; Vitrano, Sergio⁴

¹INRIM - Politecnico di Torino (DISPEA) (ITALY); ²NRCan (CANADA); ³INRIM (ITALY);

⁴Politecnico di
Torino (ITALY)

Study on the Precision of Long Baseline TWSTFT Links via Two Separated Transponder on One Telecommunication Satellite

Zhang, Hong¹; Li, Huanxin¹; Jiang, Zhiheng²

¹National Time Service Center, Chinese Academy of Sciences (CHINA); ²Bureau International des Poids et Mesures (FRANCE)

Requirements on GNSS Receivers from the Perspective of Timing Applications

Defraigne, Pascale¹; Uhrich, Pierre²; Petit, Gérard³; Aerts, Wim¹

¹royal observatory of Belgium (BELGIUM); ²3LNE-SYRTE, LNE, CNRS, UPMC, Observatoire de Paris (FRANCE); ³Bureau International des Poids et Mesures (FRANCE)

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)

Experimental Analysis of the Time Transfer Capability of Compass I

Yang, Zhiqiang

Beijing Institute of Radio Metrology and Measurement (CHINA)

GPS Receiver Relative Calibration Campaign Preparation for Galileo In-Orbit Validation

Uhrich, Pierre ; Valat, David

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

Linear Combination Model for Atomic Clock Prediction

Wang, Jigang ; Hu, Yonghui

National Time Service Center (CHINA)

New Technologies for Laser Time Transfer and their Possible Application in the Galileo Program

Prochazka, Ivan¹; Schreiber, Ulrich²; Schäfer, Wolfgang³; Cacciapuoti, Luigi⁴

¹Czech Technical University in Prague (CZECH REPUBLIC); ²BKG & Technical University Munich (GERMANY); ³Time Tech GmbH (GERMANY); ⁴European Space Agency, ESA (NETHERLANDS)

Development Status and Experimental Plan of Time Management System of Satellite Positioning System

using QZSS

Takahashi, Yasuhiro¹; Amagai, Jun¹; Fujieda, Miho¹; Nakamura, Maho¹; Aida, Masanori¹;

Nakazawa, Isao¹; Hama, Shin'ichi¹; Noda, Hiroyuki²; Kishimoto, Motohisa²; Yahagi,

Yukihiro³; Horiuchi, Satoshi⁴;

Takahashi, Tamaki⁴

¹NICT (JAPAN); ²JAXA (JAPAN); ³NEC Engineering (JAPAN); ⁴NEC (JAPAN)

Results of Evaluation of Time Signals Receiving from NTP Servers in Poland
Dobrogowski, Andrzej ; Jessa, Mieczysław ; Kasznia, Michał ; Lange, Krzysztof
Poznań University of Technology (POLAND)

Research on the Technology of Common-View Based on the Chinese Area Positioning System

wu, jianfeng ; Hu, yonghui ; Ma, hongjiao ; Jing, wenfang
National Time Service Center, Chinese Academy of Sciences (CHINA)

Comparison of GPS and Fiber Frequency Links

Wübbena, Temmo Wichert
Leibniz Universität Hannover (GERMANY)

15:40 Coffee break

Session 17 - ACES

16:10 ACES Status at Completion of the Engineering Models Phase

Cacciapuoti, L.¹; Much, R.¹; Feltham, S.¹; Nasca, R.¹; Vudali, T.¹; Hess, M.P.²; Stringhetti, L.²; Salomon, C.³

¹ESA (NETHERLANDS); ²Astrium Space Transportation (GERMANY);

³Laboratoire Kastler Brossel, ENS (FRANCE)

16:30 Development of the Space Active Hydrogen Maser for the Aces Mission

GOUJON, Didier¹; Rochat, Pascal¹; Mosset, Pierre¹; Boving, Daniel¹; Perri, Antonio¹; Rochat, Julien¹; Ramanan, Neetha¹; Simonet, Didier¹; Vernez, Xavier²; Perruchoud, G  rald³

¹Spectratime SA (SWITZERLAND); ²T4Science (SWITZERLAND); ³CSEM (SWITZERLAND)

16:50 Frequency Accuracy Evaluation of the Pharao Space Clock on Ground

Laurent, Philippe¹; Abgrall, Michel¹; Clairon, Andr  ¹; L  ger, Beno  t²; Picard, Fr  d  ric²

¹LNE-SYRTE, Observatoire de Paris (FRANCE); ²CNES (FRANCE)

17:10 Results of the ACES EM System Test

Hess, Marc Peter¹; Stringhetti, Luca¹; Cacciapuoti, Luigi²; Feltham, Steve²; Much, Rudolf²; Vudali, Tahsin²; Salomon, Christophe³; Laurent, Phillippe⁴; Benoit, Leger⁵; Delaroche, Christophe⁵; Massonnet, Didier⁵; Picard, Frederic⁵; Hejc, Gerhard⁶

¹Astrium Space Transportation (GERMANY); ²European Space Agency (NETHERLANDS); ³Laboratoire Kastler Brossel, ENS, Paris (FRANCE);

⁴Observatoire de Paris (FRANCE); ⁵CNES, French Space Agency, Toulouse (FRANCE); ⁶TimeTech GmbH (GERMANY)

17:30 Closing Session

Friday, 16 April 2010

Visit of ESTEC Facilities