

TABLE OF CONTENTS

Scroll to the title and select a [Blue](#) link to open a paper. After viewing the paper, use the bookmark to the left to return to the beginning of the Table of Contents.

MEMS Resonators I

Integration of AlN Micromechanical Contour-Mode Technology Filters with Three-Finger Dual Beam AlN MEMS Switches	1
<i>Nipun Sinha, University of Pennsylvania; Rashed Mahameed, University of Pennsylvania; Chengjie Zuo, University of Pennsylvania; Gianluca Piazza, University of Pennsylvania</i>	
Experimental Study of Temperature-Compensated Aluminum Nitride Lamb Wave Resonators	5
<i>Chih-Ming Lin, University of California at Berkeley; Ting-Ta Yen, University of California at Berkeley; Yun-Ju Lai, University of California at Berkeley; Valery V. Felmetzger, Tegal Corporation; Matthew A. Hopcroft, University of California at Berkeley; Jan H. Kuypers, University of California at Berkeley; Albert P. Pisano, University of California at Berkeley</i>	
Demonstration of Inverse Acoustic Band Gap Structures in AlN and Integration with Piezoelectric Contour Mode Wideband Transducers	10
<i>Nai-Kuei Kuo, University of Pennsylvania; Chengjie Zuo, University of Pennsylvania; Gianluca Piazza, University of Pennsylvania</i>	

Surface Acoustic Tags

Review on SAW RFID Tags	14
<i>V.P. Plessky, GVR Trade SA</i>	
Ultra Wide Band SAW Correlators Using Dual Orthogonal Frequency Coded Transducers	24
<i>D.R. Gallagher, University of Central Florida; D.C. Malocha, University of Central Florida</i>	
Characterisation Setup of SAW Devices at High Temperatures and Ultra High Frequencies	28
<i>Jochen Bardong, Carinthian Tech Research AG Austria; Gudrun Bruckner, Carinthian Tech Research AG Austria; Georg Franz, Carinthian Tech Research AG Austria; René Fachberger, Carinthian Tech Research AG Austria; Artur Erlacher, RHI Refractories AG</i>	

Noise in Components

The AM Noise Mechanism in Oscillators	33
<i>Enrico Rubiola, FEMTO-ST; Rémi Brendel, FEMTO-ST</i>	
Flicker Noise of Microwave Power Detectors	40
<i>Serge Grop, FEMTO-ST; Enrico Rubiola, FEMTO-ST</i>	

Residual Phase Noise Modelling of Amplifiers Using Silicon Bipolar Transistors	44
<i>Konstantinos Theodoropoulos, University of York; Jeremy Everard, University of York</i>	

Measurement of the Laser Relative Intensity Noise	50
<i>Enrico Rubiola, FEMTO-ST; Kirill Volyanskiy, Universite de Franche Comte; Laurent Larger, Universite de Franche Comte</i>	

Space Clocks & Fundamental Tests

Progress on Small Mercury Ion Clock for Space Applications	54
<i>John D. Prestage, Jet Propulsion Lab, California Institute of Technology; Sang K. Chung, Jet Propulsion Lab, California Institute of Technology; Robert J. Thompson, Jet Propulsion Lab, California Institute of Technology; Paul MacNeal, Jet Propulsion Lab, California Institute of Technology</i>	

MEMS Resonators II

Enhancement of Micromechanical Resonator Manufacturing Precision via Mechanically-Coupled Arraying	58
<i>Yang Lin, University of California at Berkeley; Wei-Chang Li, University of California at Berkeley; Bongsang Kim, University of California at Berkeley; Yu-Wei Lin, Broadcom Corporation; Zeying Ren, University of California at Berkeley; Clark T.-C. Nguyen, University of California at Berkeley</i>	

Bandwidth Control in Acoustically Coupled AlN Contour Mode MEMS Filters	64
<i>Carlos R. Perez, University of Pennsylvania; Gianluca Piazza, University of Pennsylvania</i>	

AlN Contour-Mode Resonators for Narrow-Band Filters Above 3 GHz	70
<i>Matteo Rinaldi, University of Pennsylvania; Chiara Zuniga, University of Pennsylvania; Chengjie Zuo, University of Pennsylvania; Gianluca Piazza, University of Pennsylvania</i>	

High Frequency Lamb Wave Resonator Using LiNbO3 Thin Film by CVD	75
<i>Michio Kadota, Murata Mfg Co, Ltd; Takashi Ogami, Murata Mfg Co, Ltd; Kansho Yamamoto, Murata Mfg Co, Ltd; Hikari Tochishita, Murata Mfg Co, Ltd</i>	

Coupled Mode Approach to the Analysis of Thin Film S0 Lamb Wave Resonators	79
<i>V. Yantchev, Uppsala University; L. Arapan, Uppsala University; I. Katardjiev, Uppsala University</i>	

Wireless Sensors

Hybrid Resonant Structures for Wireless Sensor Applications	85
<i>Jérémy Masson, Sensor; William Steichen, Thales Safare; Lionel Fagot-Revurat, MFPM; Alvaro Artieda, EPFL; Paul Muralt, EPFL; Sylvain Ballandras, FEMTO-ST</i>	

Optimization of Resonant Frequency Measurement Algorithm for Wireless Passive SAW Sensors	90
<i>V. Kalinin, Transense Technologies plc; B. Dixon, Transense Technologies plc;</i> <i>J. Beckley, Transense Technologies plc</i>	
Fabrication of Surface Acoustic Wave Wireless Pressure Sensor	96
<i>D. Hermelin, FEMTO-ST; W. Daniaux, FEMTO-ST; S. Ballandras, FEMTO-ST; B. Belgacem, Sensor</i>	
Surface Acoustic Wave Resonators As Passive Buried Sensors	100
<i>J.-M Friedt, Sensor; T. Rétornaz, Sensor; G. Martin, FEMTO-ST; T. Laroche, FEMTO-ST; É. Carry, FEMTO-ST; S. Ballandras, FEMTO-ST; J.-P. Simonnet, Franche Comté University</i>	
SAW Pressure Sensor for Vacuum Control Applications	106
<i>P. Nicolay, Nancy University; O. Elmazria, Nancy University; F. Sarry, Nancy University; L. Bouvot, Nancy University; H. Kambara, ADIXEN; K.J. Singh, Nancy University; P. Alnot, Nancy University</i>	
Improvements of Time Scales and Time Transfer	
Studies and Possible Improvements on EAL Algorithm	110
<i>G. Panfilo, Bureau International des Poids et Mesures; F. Arias, Bureau International des Poids et Mesures</i>	
The TAIPPP Pilot Experiment	116
<i>Gérard Petit, Bureau International des Poids et Mesures</i>	
GPS Carrier Phase and Precise Point Positioning Time Scale Comparisons Using Different Software Packages	120
<i>T. Feldmann, Physikalisch-Technische Bundesanstalt; A. Bauch, Physikalisch-Technische Bundesanstalt; D. Piester, Physikalisch-Technische Bundesanstalt; H. Esteban, Real Instituto y Observatorio de la Armada; J. Palacio, Real Instituto y Observatorio de la Armada; F. J. Galindo, Real Instituto y Observatorio de la Armada; T. Gotoh, National Institute of Information and Communications Technology; H. Maeno, National Institute of Information and Communications Technology; U. Weinbach, Insitut Für Erdmessung; S. Schön, Institut Für Erdmessung</i>	
Higher-Order Ionosphere Perturbations in GPS Time and Frequency Transfer	126
<i>S. Pireaux, Royal Observatory of Belgium; P. Defraigne, Royal Observatory of Belgium; L. Wauters, Royal Observatory of Belgium; N. Bergeot, Royal Observatory of Belgium; Q. Baire, Royal Observatory of Belgium; C. Bruyninx, Royal Observatory of Belgium</i>	
Optical Clocks I	
Blackbody Radiation Shifts and Theoretical Contributions to Atomic Clock Research	132
<i>M.S. Safronova, University of Delaware; M.G. Kozlov, Petersburg Nuclear Physics Institute; Dansha Jiang, University of Delaware; Bindiya Arora, University of Delaware; Charles W. Clark, National Institute of Standards and Technology; U.I. Safronova, University of Nevada, Reno; W.R. Johnson, University of Notre Dame</i>	

Frequency Measurement of the 2S_{1/2} - 2D_{3/2} Electric Quadrupole Transition in a Single 171Yb⁺ Ion	141
<i>Stephen Webster, National Physical Laboratory; Rachel Godun, National Physical Laboratory; Steven King, National Physical Laboratory; Guilong Huang, National Physical Laboratory; Barney Walton, National Physical Laboratory; Veronika Tsaturian, National Physical Laboratory; Helen Margolis, National Physical Laboratory; Stephen Lea, National Physical Laboratory; Patrick Gill, National Physical Laboratory</i>	
Determining the Clock Frequency Shift Due to Collisions in a 1-D Optical Lattice Clock with 88Sr	146
<i>J.S.R. Vellore Winfred, Physikalisch-Technische Bundesanstalt; Ch. Lisdat, Physikalisch-Technische Bundesanstalt; T. Middelmann, Physikalisch-Technische Bundesanstalt; F. Riehle, Physikalisch-Technische Bundesanstalt; U. Sterr, Physikalisch-Technische Bundesanstalt</i>	
 Materials and Relation To Devices	
Poisson's Ratios of Technological Materials	150
<i>Arthur Ballato, US Army</i>	
Measured Versus Predicted High Temperature Langatate Behavior Up to 900°C	155
<i>Peter Davulis, University of Maine; Mauricio Pereira da Cunha, University of Maine</i>	
Assessment of Langatate Material Constants and Temperature Coefficients Using SAW Delay Line Measurements	160
<i>Blake T. Sturtevant, University of Maine; Mauricio Pereira da Cunha, University of Maine</i>	
Crystal Quality of LGT Samples: Influence on BAW Resonators	166
<i>Jean-Jacques Boy, FEMTO-ST</i>	
 Quartz Oscillators	
Effects of Radiation on Performance of Space-Borne Quartz Crystal Oscillators	171
<i>M. Bloch, Frequency Electronics, Inc; O. Mancini, Frequency Electronics, Inc; T. McClelland, Frequency Electronics, Inc</i>	
Acceleration "G" Compensated Quartz Crystal Oscillators	175
<i>M. Bloch, Frequency Electronics, Inc; O. Mancini, Frequency Electronics, Inc; T. McClelland, Frequency Electronics, Inc; L. Terracciano, Frequency Electronics, Inc</i>	
High Performance Oscillator Evaluation	181
<i>J.L. Hanssen, US Naval Observatory; Christopher R. Ekstrom, US Naval Observatory; Warren F. Walls, US Naval Observatory</i>	
Lowest Flicker-Frequency Floor Measured on BVA Oscillators	185
<i>A. Kuna, Institute of Photonics and Electronics; J. Čermák, Institute of Photonics and Electronics; L. Šojdr, Institute of Photonics and Electronics; P. Salzenstein, FEMTO-ST; F. Lefebvre, Oscilloquartz</i>	

Composite Clock Including a Cs Clock, a H-Maser Clock and a VCO	188
<i>C. Plantard, UTINAM; P.M. Mbaye, UTINAM; F. Vernotte, UTINAM</i>	

Space Applications & New Techniques

Time Transfer by Laser Link T2L2 First Results	194
<i>E. Samain, OCA; P. Exertier, OCA; Ph. Guillemot, CNES; F. Pierron, OCA; D. Albanese, OCA; J. Paris, OCA; J.-M. Torre, OCA; I. Petitbon, CNES; S. Leon, CNES</i>	

Status of the ACES Mission	199
<i>R. Much, European Space Agency; E. Daganzo, European Space Agency; S. Feltham, European Space Agency; R. Nasca, European Space Agency; M.P. Hess, Astrium Space Transportation; L. Stringhetti, Astrium Space Transportation; L. Cacciapuoti, European Space Agency; C. Salomon, Laboratoire Kastler Brossel</i>	

Novel Time Synchronization Techniques for Deep Space Probes	205
<i>E. Re, Carlo Gavazzi Space; A. Di Cintio, Carlo Gavazzi Space; G. Busca, Kytime; D. Giunta, European Space Agency; M. Sanchez, Deimos Space</i>	

The Cross-Link Tecnique for Deep Space Missions	211
<i>E. Rossini, Space Engineering SpA; G. Gallinaro, Space Engineering SpA; G. Palmerini, University "La Sapienza"; L. Schirone, University "La Sapienza"; L. Iess, University "La Sapienza"; D. Giunta, ESA-ESTEC</i>	

Common-View Time Transfer Experiment Based on COMPASS-M1 Satellite	216
<i>Fenglei Wu, Chinese Academy of Sciences; Xuhai Yang, Chinese Academy of Sciences; Xiaohui Li, Chinese Academy of Sciences; Wenhai Jiao, China Satellite Navigation Project Center; Xiaolin Jia, China Satellite Navigation Project Center; Fen Cao, Chinese Academy of Sciences; Le Sun, Chinese Academy of Sciences</i>	

Spin Squeezing

Producing Squeezed Input States for an Atomic Clock Using an Optical Cavity	220
<i>Ian D. Leroux, Massachusetts Institute of Technology; Monika H. Schleier-Smith, Massachusetts Institute of Technology; Vladan Vuletić, Massachusetts Institute of Technology</i>	

High Frequency Acoustic Waves & Microwaves

A SAW Resonator with Two-Dimensional Reflectors	226
<i>Marc Solal, TriQuint Semiconductor Inc.; Julien Gratier, TriQuint Semiconductor Inc.; Taeho Kook, TriQuint Semiconductor Inc.</i>	

High Q X-Band Distributed Bragg Resonator Utilising an Aperiodic Alumina Plate Arrangement	232
<i>Simon Bale, University of York; Jeremy Everard, University of York</i>	

Self Heating Under RF Power in BAW SMR and its Predictive 1D Thermal Model	237
<i>N.B. Hassine, STMicroelectronics; D. Mercier, CEA-LETI/MINATEC; P. Renaux, CEA-LETI/MINATEC; D. Bloch, CEA-LETI/MINATEC; G. Parat, CEA-LETI/MINATEC; B. Ivira, CEA-LETI/MINATEC; P. Waltz, STMicroelectronics; C. Chappaz, STMicroelectronics; R. Fillit, Ecole Nationale Supérieure des Mines de Saint-Etienne; S. Basrour, TIMA CNRS-UJF-INPG</i>	

Change in Piezoelectric Boundary Acoustic Wave Characteristics with Overlay and Metal Grating Materials	241
<i>Yiliu Wang, Chiba University; Ken-Ya Hashimoto, Chiba University; Tatsuya Omori, Chiba University; Masatsune Yamaguchi, Chiba University</i>	

New Materials and Techniques

Layer Guided Surface Acoustic Wave Sensors Using Langasite Substrates	245
<i>Robert H. Morris, Nottingham Trent University; Michael I. Newton, Nottingham Trent University; Paul Roach, Nottingham Trent University; Nicola Doy, Nottingham Trent University; Carl R. Evans, Nottingham Trent University; Shaun Atherton, Nottingham Trent University; Glen McHale, Nottingham Trent University</i>	

Transmission Properties of a 1D Resonant Cavity	248
<i>Ralf Lucklum, Otto-von-Guericke-University; Ines Hauer, Otto-von-Guericke-University</i>	

Acoustoelectric Effect Study for SAW Sensors	254
<i>D.C. Malocha, University of Central Florida; B. Fisher, University of Central Florida</i>	

Thermal Control of a Dual Mode Parametric Sapphire Transducer	260
<i>Jacopol Belfi, Unità di Pisa; Nicolò Beverini, Unità di Pisa; Andrea De Michele, Unità di Pisa; Gianluca Gabbriellini, Unità di Pisa; Francesco Mango, Unità di Pisa; Roberto Passaquieti, Unità di Pisa</i>	

GPS Receivers and Calibration

Evaluation of State-of-the-Art Geodetic GPS Receivers for Frequency Comparisons	263
<i>U. Weinbach, Leibniz Universität Hannover; S. Schön, Leibniz Universität Hannover; T. Feldmann, Physikalisch-Technische Bundesanstalt</i>	

Time and Frequency Transfer by Geodetic GPS: Comparison of Receivers and Computation Techniques	269
<i>Gérard Petit, Bureau International des Poids et Mesures; Laurent-Guy Bernier, METAS; Pierre Urrich, LNE-SYRTE</i>	

A GPS Calibration Trip Experience Between ROA and PTB	274
<i>H. Esteban, Real Instituto y Observatorio de la Armada; J. Palacio, Real Instituto y Observatorio de la Armada; F.J. Galindo, Real Instituto y Observatorio de la Armada; T. Feldmann, Physikalisch-Technische Bundesanstalt; A. Bauch, Physikalisch-Technische Bundesanstalt; D. Piester, Physikalisch-Technische Bundesanstalt</i>	

Microwave Clocks I

Flywheel Oscillator for Atomic Fountain Clocks Using Ultra-Stable Lasers and a Fiber-Based Optical Frequency Comb 280

J. Millo, Observatoire de Paris; Y. Le Coq, Observatoire de Paris; S. Bize, Observatoire de Paris; J. Guéna, Observatoire de Paris; J. Jiang, Observatoire de Paris; M. Abgrall, Observatoire de Paris; E.M.L. English, Observatoire de Paris; A. Clairon, Observatoire de Paris; G. Santarelli, Observatoire de Paris; M.E. Tobar, University of Western Australia

High Power Solid-State Sapphire Whispering Gallery Mode Maser 282

Daniel L. Creedon, The University of Western Australia; Karim Benmessaï, The University of Western Australia; Michael E. Tobar, University of Western Australia; John G. Hartnett, The University of Western Australia; Pierre-Yves Bourgeois, Institut FEMTO-ST; Yann Kersale, Institut FEMTO-ST; Jean-Michel Le Floch, The University of Western Australia; Vincent Giordano, Institut FEMTO-ST

Materials, Filters & Resonators I

Hollow-Core Resonator Based on Out-of-Plane 2D Photonic Band-Gap Crystal Cladding 286

Georges Humbert, XLIM UMR CNRS Université de Limoges; David Mouneyrac, XLIM, UMR CNRS Université de Limoges; Denis Férachou, XLIM, UMR CNRS Université de Limoges; Dominique Cros, XLIM, UMR CNRS Université de Limoges; Jean-Marc Blondy, XLIM, UMR CNRS Université de Limoges; Jean-Michel Le Floch, University of Western Australia; David Mouneyrac, University of Western Australia; Michael E. Tobar, University of Western Australia

Mode Conversion in High Overtone Bulk Acoustic Wave Resonators 290

M. Pijolat, CEA, LETI, MINATEC; D. Mercier, CEA, LETI, MINATEC; A. Reinhardt, CEA, LETI, MINATEC; E. Defaj, CEA, LETI, MINATEC; C. Deguet, CEA, LETI, MINATEC; M. Aïd, CEA, LETI, MINATEC; J.S. Moulet, Silicon-on-Insulator Technologies; B. Ghyselen, Silicon-on-Insulator Technologies; S. Ballandras, FEMTO-ST UMR CNRS-UFC-ENSM-UTBM

Characterization of Doped BST Thin Films Deposited by Sol-Gel for Tunable Microwave Devices 295

A. Khalfallaoui, Univ Lille Nord de France; G. Vélou, Univ Lille Nord de France; L. Burgnies, Univ Lille Nord de France; J.C. Carru, Univ Lille Nord de France

Time Resolved Synchrotron Radiation X-Ray Topography Study of Surface Acoustic Waves Propagation 299

Bernard Capelle, Institut de Minéralogie et de Physique des Milieux Condensés; Yves Epelboin, Institut de Minéralogie et de Physique des Milieux Condensés; Jacques Détaint, Institut de Minéralogie et de Physique des Milieux Condensés; Alain Soyer, Institut de Minéralogie et de Physique des Milieux Condensés; Jürgen Härtwig, European Synchrotron Radiation Facility

Thin Film BAW Resonators

Isolated Acoustic Wave Based on AlN/ZnO/Diamond Structure for Sensor Applications 305

Laurent Le Brizoual, Université Nantes; Omar Elmazria, Nancy University; Sergei Zghoon, Moscow Power Engineering Institute; Akram Soussou, Université Nantes; Frederic Sarry, Nancy University; Mohammed Abdou Djouadi, Université Nantes

High-Overtone Bulk Acoustic Wave Resonator on Galliumnitride 309

Marc Loschonsky, IMTEK; David Eisele, IMTEK; Jeremy Masson, IMTEK - Universität Freiburg; Matthias Wieneke, Otto-von-Guericke-Universität Magdeburg; Sebastian Alzuaga, CNRS-UFC-ENSMM-UTBM; Armin Dadgar, Otto-von-Guericke-Universität Magdeburg; Sylvain Ballandras, CNRS-UFC-ENSMM-UTBM; Alois Krost, Otto-von-Guericke-Universität Magdeburg; Leonhard Reindl, IMTEK

Sputtered SiO₂ As Low Acoustic Impedance Material for Bragg Mirror Fabrication in BAW Resonators 316

J. Olivares, Universidad Politécnica de Madrid; E. Wegmann, Universidad Politécnica de Madrid; J. Capilla, Universidad Politécnica de Madrid; E. Iborra, Universidad Politécnica de Madrid; M. Clement, Universidad Politécnica de Madrid; L. Vergara, ICM-SCIC; R. Aigner, TriQuint Semiconductor

Noise in Systems and Oscillators

The Profound Impact of Negative Power Law Noise on the Estimation of Causal Behavior 322

Victor S. Reinhardt, Raytheon Space and Airborne Systems

On Modern and Historical Short-Term Frequency Stability Metrics for Frequency Sources 328

Michael S. McCorquodale, Mobius Microsystems, Inc; Richard B. Brown, University of Utah

More Fundamental Instabilities in Oscillators? 334

Michael J. Underhill, Underhill Research and Toric Limited

Low Phase Noise Oscillators: Theory and Application 338

Jeremy Everard, University of York

Optical Clocks II

Self-Referenced Er-Fiber Laser Comb with 300 MHz Comb Spacing 344

Jin-Long Peng, Center for Measurement Standards; Tze-An Liu, Center for Measurement Standards; Ren-Huei Shu, Center for Measurement Standards

An Optical Lattice Clock Based on Bosonic Sr 347

Nicola Poli, Università di Firenze; Marco G. Tarallo, Università di Firenze; Marco Schioppo, Università di Firenze; Christopher W. Oates, Università di Firenze; Guglielmo M. Tino, Università di Firenze

Quartz & Related Topics

Study of the Factors Limiting the Q Factors of High Performance Quartz Resonators 352

Jacques Detaint, Institut de Minéralogie et de Physique des Milieux Condensés; Bernard Capelle, Institut de Minéralogie et de Physique des Milieux Condensés; Yves Epelboin, Institut de Minéralogie et de Physique des Milieux Condensés

Common Mode Rejection in Electrically Coupled MEMS Resonators Utilizing Mode Localization for Sensor Applications 358

P. Thiruvengatanathan, University of Cambridge; J. Yan, University of Cambridge; A.A. Seshia, University of Cambridge

Emerging Applications

Emerging Applications Requiring Precision Time and Frequency 364

M. Bloch, Frequency Electronics, Inc; D. Léonard, Frequency Electronics, Inc; O. Mancini, Frequency Electronics, Inc; T. McClelland, Frequency Electronics, Inc

Stability Measurements of Frequency Synthesis with Cryogenic Sapphire Oscillators 372

John G. Hartnett, University of Western Australia; Daniel Creedon, University of Western Australia; D. Chambon, LNE-SYRTE; G. Santarelli, LNE-SYRTE

ELISA: an Ultra-Stable Oscillator for ESA Deep Space Antennas 376

S. Grop, FEMTO-ST; V. Giordano, FEMTO-ST; P.Y. Bourgeois, FEMTO-ST; N. Bazin, FEMTO-ST; Y. Kersalé, FEMTO-ST; M. Oxborrow, National Physical Laboratory; G. Marra, National Physical Laboratory; C. Langham, National Physical Laboratory; E. Rubiola, FEMTO-ST; J. DeVincente, European Spatial Agency

1.05 GHz MEMS Oscillator Based on Lateral-Field-Excited Piezoelectric AlN Resonators 381

Chengjie Zuo, University of Pennsylvania; Jan Van der Spiegel, University of Pennsylvania; Gianluca Piazza, University of Pennsylvania

A 1.5GHz CMOS/FBAR Frequency Reference with ± 10 ppm Temperature Stability 385

Shailesh Rai, University of Washington; Ying Su, University of Washington; Aron Dobos, University of Washington; Richard Kim, University of Washington; Richard Ruby, Avago Technologies; Wei Pang, Avago Technologies; Brian Otis, University of Washington

GNSS Clocks & Timing

Update on the in-Orbit Performances of GIOVE Clocks 388

Pierre Waller, ESA/ESTEC; Francisco Gonzalez, ESA/ESTEC; Stefano Binda, ESA/ESTEC; Ilaria Sesia, INRiM; Patrizia Tavella, INRiM; Irene Hidalgo, GMV; Guillermo Tobias, GMV

Space Passive Hydrogen Maser - Performances and Lifetime Data-	393
<i>Fabien Droz, SpectraTime; Pierre Mosset, SpectraTime; Qinghua Wang, SpectraTime; Pascal Rochat, SpectraTime; Marco Belloni, Selex Galileo; Marina Gioia, Selex Galileo; Alberto Resti, European Space Agency; Pierre Waller, European Space Agency</i>	
Performance Assessment of the Time Difference Between EGNOS-Network-Time and UTC	399
<i>Jérôme Delporte, CNES; Norbert Suard, CNES; Pierre Uhrich, Observatoire de Paris</i>	
Galileo Timing Applications and ACTS Prototyping	405
<i>Claudio Cantelmo, B.U. Navigation & Integrated Communications; Renzo Zanello, B.U. Navigation & Integrated Communications; Marco Bianchi, B.U. Navigation & Integrated Communications; Paola Capetti, SEPA; Stefano Scarda, EU GNSS Supervisory Authority</i>	
Precise Time and Frequency Distribution Over a Wireless Network for A-GNSS Users	411
<i>Edoardo Detoma, SEPA S.p.A.; Paola Capetti, SEPA S.p.A.; Jurgen Pielmeier, IFEN GmbH; Udo Maltzahn, Meinberg Funkuhren GmbH; Gustavo Lopez Risueno, ESA/ESTEC</i>	
 Materials, Filters & Resonators II	
An Optimized SAW Chirp -Z Transform for OFDM Systems	416
<i>Takaya Watanabe, World Technology Instrument Co, Ltd</i>	
Balanced Front-End SAW Modules with Improved Selectivity at Low Frequency Offsets for Handheld Transceivers	420
<i>Sergei Doberstein, ONIIP</i>	
2-and-3D Analysis of Temperature Effects on Periodic Transducers Using a FEA/BEM Approach	424
<i>Julien Garcia, FEMTO-ST; Thierry Laroche, FEMTO-ST; William Daniau, FEMTO-ST; Emile Carry, FEMTO-ST; Gilles Martin, FEMTO-ST; S. Ballandras, FEMTO-ST; Jean-Michel Friedt, SENSEOR SAS</i>	
On the Convergence of 2D and 3D Finite Element/Boundary Element Analysis for Periodic Acoustic Waveguides	430
<i>William Daniau, FEMTO-ST; Michel Lenczner, FEMTO-ST; Thierry Laroche, FEMTO-ST; Julien Garcia, FEMTO-ST; Emile Carry, FEMTO-ST; Sylvain Ballandras, FEMTO-ST</i>	
Effects of Electrode Inertia on Vibration of Piezoelectric Plate with Dissipation	435
<i>Jianke Du, Ningbo University; Xin Yin, Ningbo University; Yook-Kong Yong, Rutgers University; Kai Xian, Ningbo University; Ji Wang, Ningbo University</i>	
Point Spread Function of Electrical Probe for Measuring Induced Charge on Surface of Piezoelectric Vibrator	438
<i>Shigetaka Kaga, Nihon Dempa Kogyo Co, Ltd; Morio Onoe, University of Tokyo</i>	

The Influence of Electrode's Stratified Structures on SAW Devices Microwave Characteristics	443
<i>Sergey Suchkov, Saratov State University; Dmitriy Suchkov, Saratov State University;</i> <i>Dmitriy Chaikovskiy, Saratov State University</i>	
Theoretical Analysis of SAW Propagation Characteristics in (100)	
Oriented AlN/Diamond Structure	446
<i>Chia-Chi Sung, National Taiwan University; Yuan-Feng Chiang, National Taiwan University;</i> <i>Ruyen Ro, I-Shou University; Ruyue Lee, I-Shou University; Sean Wu, Tung-Fang Institute of Technology</i>	
An Analysis of Vibrations of Quartz Crystal Plates with Nonlinear Mindlin Plate Equations	450
<i>Ji Wang, Ningbo University; Rongxing Wu, Ningbo University; Yook-Kong Yong, Rutgers University;</i> <i>Jianke Du, Ningbo University; Dejin Huang, Ningbo University</i>	
The Fifth-Order Overtone Vibrations of Quartz Crystal Plates with	
Higher-Order Mindlin Plate Equations	455
<i>Ji Wang, Ningbo University; Lijun Yang, Ningbo University; Nisha Sun, Ningbo University;</i> <i>Rongxing Wu, Ningbo University; Jianke Du, Ningbo University; Dejin Huang, Ningbo University</i>	
The Effects of Acoustic Mismatch on Internal Dielectrically Transduced	
Micromechanical Resonators	460
<i>Eugene Hwang, Cornell University; Sunil A. Bhawe, Cornell University</i>	
Universal Modeling of the Bulk Acoustic Wave Devices	466
<i>Boris Sveshnikov, Nizhny Novgorod State University</i>	
Oscillators, Synthesizers & Noise I	
A Novel Voltage Controlled Crystal Oscillator (VCXO)	470
<i>Ulrich L. Rohde, Synergy Microwave Corporation; Ajay K. Poddar, Synergy Microwave Corporation</i>	
An RCC Receiver IC with TAD-DQD and ADPLL Using Frequency	
Multiplying Number with Decimals	478
<i>Takamoto Watanabe, DENSO Corporation; Sumio Masuda, DENSO Corporation;</i> <i>Hiroyuki Wakairo, Seiko NPC Corporation</i>	
FEM Thermal Analysis of Quartz Oscillator with COMSOL	482
<i>T. Louvet-Carron, TEMEX; J. Leost, TEMEX</i>	
The Effect of Power-Drive Level on the Calibration of the Bridge Instrument for the	
Measurement of the Quartz Stability	487
<i>F. Sthal, FEMTO-ST; S. Galliou, FEMTO-ST; J. Imbaud, FEMTO-ST; X. Vacheret, FEMTO-ST;</i> <i>P. Salzenstein, FEMTO-ST; E. Rubiola, FEMTO-ST; G. Cibieli, CNES</i>	
A Novel Phase Processing Approach Based on New Concept and Method	492
<i>Wei Zhou, Xidian University; Miao Miao, Xidian University; Hui Zhou, Xidian University;</i> <i>Baoqiang Du, Xidian University; Hainiu Zhou, Xidian University</i>	

Synthesis Chains Based on Ultra-Stable Cryogenic Sapphire Oscillator at NICT	496
<i>Motohiro Kumagai, National Institute of Information and Communications Technology; Hiroyuki Ito, National Institute of Information and Communications Technology; Shigeo Nagano, National Institute of Information and Communications Technology; Mizuhiko Hosokawa, National Institute of Information and Communications Technology; Giorgio Santarelli, Laboratoire national de métrologie et d'essais; Clayton R. Locke, University of Western Australia; John G. Hartnett, University of Western Australia</i>	
Analysis of Two-Stage Passive Vibration Isolation System for Crystal Oscillator at High-Frequency Vibration	501
<i>Wei Fu, University of Electronic Science and Technology of China; Zhichao Qian, University of Electronic Science and Technology of China; Xianhe Huang, University of Electronic Science and Technology of China; Feng Tan, University of Electronic Science and Technology of China</i>	
Study of Dual-Loop Optoelectronic Oscillators	505
<i>Etgar Levy, Technion Israel Institute of Technology; Moshe Horowitz, Technion Israel Institute of Technology; Olukayode Okusaga, University of Maryland Baltimore County; Curtis Menyuk, University of Maryland Baltimore County; Gary Carter, University of Maryland Baltimore County; Weimin Zhou, US Army Research Laboratory</i>	
A New Method for the Design of Digital Disciplined	508
<i>Yu Xiang, National Time Service Center, Chinese Academy of Sciences; Yu Hua, National Time Service Center, Chinese Academy of Sciences; Wei Guo, National Time Service Center, Chinese Academy of Sciences; Wei Zhang, Xi'an Branch, Chinese Academy of Sciences</i>	
Phase Noise in Detached Crystal Oscillators	512
<i>Luc A. Omlin, L Omlin</i>	
Multi-Mode Crystal Oscillator for Simultaneous Excitation of Three Thickness-Shear Modes in Stress Compensated Resonator	516
<i>Vladimír Štofanič, Slovak Academy of Sciences; Igor Baláž, Slovak University of Technology in Bratislava; Marián Minárik, Slovak University of Technology in Bratislava; Stanislav Kozinka, Slovak University of Technology in Bratislava</i>	
9 MHz Vibrating Body FET Tuning Fork Oscillator	520
<i>Daniel Grogg, Nanoelectronic Devices Laboratory; Fabrizio Lo Conte, Ecole Polytechnique Fédérale de Lausanne; Maher Kayal, Ecole Polytechnique Fédérale de Lausanne; Adrian Mihai Ionescu, Nanoelectronic Devices Laboratory</i>	
Effect of Vibration on PM and AM Noise of Oscillatory and Non-Oscillatory Components at 10 GHz	524
<i>A. Hati, National Institute of Standards and Technology; C.W. Nelson, National Institute of Standards and Technology; D.A. Howe, National Institute of Standards and Technology</i>	
High Performance of DMTD System Used in a Composite Clock	530
<i>C. Plantard, Besançon Observatory; P.M. Mbaye, Besançon Observatory; F. Vernotte, Besançon Observatory</i>	

Low Phase Noise Frequency Synthesiser for the Trapped Atom Clock on a Chip	535
<i>F. Ramírez-Martínez, Observatoire de Paris; M. Lours, Observatoire de Paris; P. Rosenbusch, Observatoire de Paris; F. Reinhard, Laboratoire Kastler Brossel, Ecole Normale Supérieure; J. Reichel, Laboratoire Kastler Brossel, Ecole Normale Supérieure</i>	
Almost All-Digital Sinewave-Product Generation for Frequency Synthesis Applications	540
<i>William A. Ling, Johns Hopkins University and Sotekco Electronics, LLC; Paul Peter Sotiriadis, Johns Hopkins University and Sotekco Electronics, LLC</i>	
Timekeeping, Optical & Microwave Atomic Standards I	
A New Method to Reduce Frequency-Temperature Coefficient of Sapphire Loaded Cavity for Compact Hydrogen Masers	544
<i>Ren-Fu Yang, Beijing Institute of Radio Metrology & Measurement; Tie-Zhong Zhou, Beijing Institute of Radio Metrology & Measurement; Hai-bo Chen, Beijing Institute of Radio Metrology & Measurement; Nuan-Rang Wang, National Key Laboratory of Metrology and Calibration Technology; Lian-Shan Gao, National Key Laboratory of Metrology and Calibration Technology</i>	
Designs of a Miniaturized Sapphire-Loaded Cavity for Space Borne Hydrogen Masers	548
<i>Ren-Fu Yang, Beijing Institute of Radio Metrology & Measurement; Tie-Zhong Zhou, Beijing Institute of Radio Metrology & Measurement; Nuan-Rang Wang, National Key Laboratory of Metrology and Calibration Technology; Lian-Shan Gao, Beijing Institute of Radio Metrology & Measurement</i>	
Improvement of the Atomic Hydrogen Maser for Chinese Compass System	553
<i>Yong Cai, Shanghai Astronomical Observatory Chinese Academy of Sciences; Yidong Wu, Shanghai Astronomical Observatory Chinese Academy of Sciences; Yan-jun Zhang, Shanghai Astronomical Observatory Chinese Academy of Sciences; Weiqun Zhang, Shanghai Astronomical Observatory Chinese Academy of Sciences; Yiping Zhang, Shanghai Astronomical Observatory Chinese Academy of Sciences</i>	
Study of Coherent Population Trapping Occurring in ^{87}Rb Atoms Contained in Wall-Coated Cells	559
<i>Evelina Breschi, Université de Neuchâtel; Gaetano Mileti, Université de Neuchâtel</i>	
Update on the Development of NRC-FCs1	562
<i>L. Marmet, National Research Council</i>	
Application of New PLL in Active Atomic Frequency Standard Circuit	565
<i>Faxi Chen, Xidian University; Wei Zhou, Xidian University; Hao Wang, Xidian University; Ning Ding, Xidian University</i>	
Bayesian Inference of a Negative Quantity from Positive Measurement Results	568
<i>D.C. Calonico, Istituto Nazionale di Ricerca Metrologica; F. Levi, Istituto Nazionale di Ricerca Metrologica; L. Lorini, Istituto Nazionale di Ricerca Metrologica; G. Mana, Istituto Nazionale di Ricerca Metrologica</i>	
The Chip-Scale Atomic Clock – Recent Developments	573
<i>Robert Lutwak, Symmetricom</i>	

85Rb D1-Line CPT Atomic Clock with Low Power Consumption	578
<i>Shigeyoshi Goka, Tokyo Metropolitan University</i>	
FM Spectroscopy of CPT Resonances with AOM Operating Purely in the Raman-Nath Diffraction Regime As Optic Phase Modulator	582
<i>Viacheslav Baryshev, FGUP VNIIFTRI; Viacheslav Epikhin, FGUP VNIIFTRI; Leonid Kopylov, FGUP VNIIFTRI; Yury Domnin, FGUP VNIIFTRI</i>	
Comparison of Achievable Performances As Regards Rubidium Gas Cell Frequency Standards with Continuous and Pulse Laser Pumping and with Coherent Population Trapping	587
<i>V. Zholnerov, Russian Institute of Radionavigation and Time; A. Besedina, Russian Institute of Radionavigation and Time; G. Kazakov, St Petersburg State Polytechnic University</i>	
The European Laser Timing (ELT) Experiment on-Board ACES	594
<i>Ulrich Schreiber, Technische Universitaet Muenchen; Ivan Prochazka, Czech Technical University in Prague; Pierre Lauber, Technische Universitaet Muenchen; Urs Hugentobler, Technische Universitaet Muenchen; Wolfgang Schäfer, TimeTech GmbH; Luigi Cacciapuoti, European Space Agency; Rosario Nasca, European Space Research</i>	
Stark Shift of the Cs Clock Transition Frequency: A New Experimental Approach	600
<i>Jean-Luc Robyr, University of Fribourg; Paul Knowles, University of Fribourg; Antoine Weis, University of Fribourg</i>	
Preliminary Results of the Trapped Atom Clock on a Chip	604
<i>Clement Lacroute, Observatoire de Paris; Fernando Ramirez-Martinez, Observatoire de Paris; Peter Rosenbusch, Observatoire de Paris; Friedemann Reinhard, Physikalisches Institut, Stuttgart; Christian Deutsch, Laboratoire Kastler Brossel; Tobias Schneider, Institut für Experimentalphysik, Düsseldorf; Jakob Reichel, Laboratoire Kastler Brossel</i>	
Sensors & Transducers I	
A Study on the Metal Tube Type Ultrasonic Motor (MTTUSM)	609
<i>Jou Jwo Ming, Cheng Shiu University</i>	
Application of Acoustical Activity for Measurement of Acoustic Wave Frequency	613
<i>F.R. Akhmedzhanov, Navoi State Mining Institute</i>	
SAW Noise-Like Anti-Collision Code Study	616
<i>N.Y. Kozlovski, University of Central Florida; D.C. Malocha, University of Central Florida</i>	
Influence of Diffraction on the SAW Tag Characteristics	622
<i>Boris Sveshnikov, Nizhny Novgorod State University</i>	
Drift Errors in Passive Remote Wireless SAW Sensing with Multiple DPM	626
<i>Yuriy S. Shmaliy, Guanajuato University; Oleksandr Shmaliy, Engineering Pedagogical Academy, Kharkiv; Oscar Ibarra-Manzano, Guanajuato University</i>	

Time & Frequency Measurement & Transfer I

SATER Modem Used in Microwave Time Transfer	632
<i>Wei Li, National Time Service Center; Shaowu Dong, National Time Service Center; Haibo Yuan, National Time Service Center; Chunxia Liu, National Time Service Center; Hong Zhang, National Time Service Center</i>	
Precise Time Transfer Activities in Singapore	634
<i>Yanying Liu, National Metrology Centre; Z. Jiang, Bureau International des Poids et Mesures; Hideo Maeno, National Institute of Information and Communications Technology; Ryo Tabuchi, National Institute of Information and Communications Technology</i>	
The Hydrogen Maser and Cesium Clocks in Time Keeping at NTSC	639
<i>Haibo Yuan, National Time Service Center; Lili Qu, National Time Service Center; Shaowu Dong, National Time Service Center; Wei Li, National Time Service Center; Hong Zhang, National Time Service Center</i>	
Development of Deep-Space Navigation by Pulsars in China	643
<i>Sun Hongwei, Xi'an University of Arts and Science; Chen Guangfeng, Xi'an University of Arts and Science; Yuan Haibo, National Time Service Center; Zhang Hong, National Time Service Center</i>	
Implementing the Galileo Precise Timing Facility	647
<i>Renzo Zanello, ThalesAleniaSpace; Marco Bianchi, Thales Alenia Space; Chiara Piras, SOFITER Group/TAS ext; Edoardo Detoma, SEPA; Paola Capetti, SEPA; Angelo Bellotti, Alenia SIA; Diego Villabruna, Alenia SIA</i>	
Time and Frequency Activities at the U.S. Naval Observatory	653
<i>Demetrios Matsakis, U.S. Naval Observatory</i>	
A GPS Carrier-Phase Aided Clock Transport for the Calibration of a Regional Distributed Time Scale	659
<i>Kenneth Jaldehag, SP Technical Research Institute of Sweden; Carsten Rieck, SP Technical Research Institute of Sweden; Per Jarlemark, SP Technical Research Institute of Sweden</i>	
Study of Algorithm to Ensemble Atomic Time	664
<i>Chong Xia Zhong, Beijing Institute of Radio Metrology and Measurement; Yue Qing Xu, Beijing Institute of Radio Metrology and Measurement; Jun Yang, Beijing Institute of Radio Metrology and Measurement; Sheng Kang Zhang, Beijing Institute of Radio Metrology and Measurement</i>	
Combination of GPS and TWSTFT Data for Time and Frequency Transfer	670
<i>Maria Carmen Martínez, Alicante University; Pascale Defraigne, Royal Observatory of Belgium</i>	
Ultrahigh Resolution Frequency Measurement Scheme Based on Phase Relationship Between Period Groups	676
<i>Faxi Chen, Xidian University; Wei Zhou, Xidian University; Zi Ye, Zhejiang University; Hai Wang, Xidian University</i>	
Multi-Channel Beat-Frequency Digital Measurement System for Frequency Standard	679
<i>Ya Liu, National Time Service Center; Xiao-Hui Li, National Time Service Center; Yu-Lan Wang, National Time Service Center</i>	

Fast Computation of the Dynamic Allan Variance	685
<i>Lorenzo Galleani, Politecnico di Torino; Patrizia Tavella, INRIM</i>	
Algorithm of Intersatellite Dynamic Two-Way Time Transfer Based on GEO Satellite	688
<i>Feijiang Huang, National Time Service Center; Xiaochun Lu, National Time Service Center;</i>	
<i>Haitao Wu, National Time Service Center; Yujing Bian, National Time Service Center;</i>	
<i>Hang Zhao, National Time Service Center</i>	
Research on Computer Time Synchronization	692
<i>Lei Hou, National Time Service Center; Yonghui Hu, National Time Service Center; Junliang Liu, National</i>	
<i>Time Service Center; Rui Xu, National Time Service Center; Wei Guo, National Time Service Center;</i>	
<i>Yu Xiang, National Time Service Center</i>	
The Effect of Error in Position Co-Ordinates of the Receiving Antenna on the	
Single-Satellite-Mode GPS Timing	695
<i>Suman Sharma, National Physical Laboratory; P. Banerjee, National Physical Laboratory</i>	
Digital Time Stamping System Based on Open Source Technologies	700
<i>R. Miškinis, Semiconductor Physics Institute; D. Smirnov, Semiconductor Physics Institute;</i>	
<i>E. Urba, Semiconductor Physics Institute; A. Burokas, Semiconductor Physics Institute;</i>	
<i>B. Malyško, State Tax Inspectorate; P. Laud, Cybernetica AS; F. Zuliani, Nergal S.r.l.</i>	
Transmission Time-Based Authentication Scheme Using 3G Mobile Device for DRM System	706
<i>Takahiro Tsuchiya, Nihon University; Masami Kihara, Nihon University; Arjule John P. Berena, National</i>	
<i>Institute of Informatics</i>	
First Application of the T2L2 Ground to Space Time Transfer:	
Characterisation of the DORIS USO	711
<i>Ph. Guillemot, CNES - French Space Agency; P. Exertier, Observatoire de la Côte d'Azur; E. Samain,</i>	
<i>Observatoire de la Côte d'Azur; Ch. Jayles, CNES - French Space Agency; F. Cibié, CNES - French Space</i>	
<i>Agency; S. Leon, CNES - French Space Agency</i>	
Laboratory Experiment of 9.2 GHz Frequency Transfer with a Fiber	715
<i>Weiliang Chen, Beijing Institute of Technology; Tianchu Li, National Institute of Metrology;</i>	
<i>Pingwei Lin, National Institute of Metrology; Yige Lin, National Institute of Metrology</i>	
Composite Clock : New Simulation's Results Obtained from an Algorithm Developed for	
Locking a VCO to HM Clock and Then to Cs Frequency Standard	721
<i>P.M. Mbaye, Laboratoire d'Astrophysique de l'Observatoire de Besançon; C.W. Plantard, Laboratoire</i>	
<i>d'Astrophysique de l'Observatoire de Besançon; A. Makdissi, Laboratoire d'Astrophysique de l'Observatoire</i>	
<i>de Besançon; F. Vernotte, Laboratoire d'Astrophysique de l'Observatoire de Besançon</i>	
Long Term Time Stability of Conventional GPS Receivers	725
<i>K. Kalliomäki, MIKES; T. Mansten, MIKES; H. Koivula, MIKES; J. Mannermaa, Nokia Corporation</i>	

Efficient Predictive Steering of Local Clocks in GPS-Based Timekeeping	727
<i>Yuriy S. Shmaliy, Guanajuato University; Oscar Ibarra-Manzano, Guanajuato University; Luis Arceo-Miquel, Guanajuato University</i>	

An Innovative Time Service via Telephone Network - a Study on its Potentiality	733
<i>P. Banerjee, National Physical Laboratory; P.P. Thorat, National Physical Laboratory; A.K. Suri, National Physical Laboratory</i>	

Optical Frequency Standards & Applications I

G-Pisa gyrolaser	738
<i>J. Belfi, Università di Pisa; N. Beverini, Università di Pisa; F. Bosi, Università di Pisa; G. Carelli, Università di Pisa; A. Di Virgilio, INFN, Sezione di Pisa; R. Graham, Università di Pisa; E.M.L. Maccioni, Università di Pisa; M. Pizzocaro, Università di Pisa; A. Porzio, Unità di Napoli; U. Schreiber, Universität München Fundamentalstation; S. Solimeno, Unità di Napoli; F. Sorrentino, Università di Firenze; A. Velikoseltsev, Universität München Fundamentalstation</i>	

Methods of Conversion of Stability of Femtosecond Stabilized

Mode-Locked Laser to Optical Resonator	742
<i>Radek Šmíd, Institute of Scientific Instruments of ASCR; Ondřej Číp, Institute of Scientific Instruments of the ASCR; Josef Lazar, Institute of Scientific Instruments of the ASCR</i>	

Development of an Ultra-Narrow-Linewidth Laser for Interrogating the

1S0 - 3P0 Clock Transition in Yb Atoms	747
<i>Kazumoto Hosaka, National Metrology Institute of Japan; Masami Yasuda, National Metrology Institute of Japan; Hajime Inaba, National Metrology Institute of Japan; Takuya Kohno, CREST, Japan Science and Technology Agency; Yoshiaki Nakajima, National Metrology Institute of Japan; Atsushi Onae, National Metrology Institute of Japan; Feng-Lei Hong, National Metrology Institute of Japan</i>	

Absolute Frequency Measurement of the $^{40}\text{Ca}^+$ Clock Transition Using a LD-Based Clock Laser and UTC(NICT)

751
<i>Kensuke Matsubara, National Institute of Information and Communications Technology; Ying Li, National Institute of Information and Communications Technology; Shigeo Nagano, National Institute of Information and Communications Technology; Hiroyuki Ito, National Institute of Information and Communications Technology; Masatoshi Kajita, National Institute of Information and Communications Technology; Reiko Kojima, National Institute of Information and Communications Technology; Kazuhiro Hayasaka, National Institute of Information and Communications Technology; Yuko Hanado, National Institute of Information and Communications Technology; Mizuhiko Hosokawa, National Institute of Information and Communications Technology</i>

A Compact Source of Ultracold Ytterbium for an Optical Lattice Clock	756
<i>Charbel Abou-Jaoudeh, University Düsseldorf; Cristian Bruni, University Düsseldorf; Florian Baumer, University Düsseldorf; Axel Görlitz, University Düsseldorf</i>	

Control of the Laser Frequency of the Virgo Gravitational Wave Interferometer with an in-Loop Relative Frequency Stability of 1.0×10^{-21} on a 100 Ms Time Scale

760
<i>F. Bondu and the Virgo Collaboration</i>

Microwave Clocks II

First Dual Mode Operation of the Cs/Rb FO2 Double Fountain at SYRTE 764

J. Guéna, Observatoire de Paris; P. Rosenbusch, Observatoire de Paris; Ph. Laurent, Observatoire de Paris, CNRS; M. Abgrall, Observatoire de Paris; G.D. Rovera, Observatoire de Paris; G. Santarelli, Observatoire de Paris; S. Bize, Observatoire de Paris; A. Clairon, Observatoire de Paris; M.E. Tobar, University of Western Australia

The Cryogenic Fountain ITCsF2 769

Filippo Levi, Istituto Nazionale di Ricerca Metrologica; Claudio Calosso, Istituto Nazionale di Ricerca Metrologica; Davide Calonico, Istituto Nazionale di Ricerca Metrologica; Luca Lorini, Istituto Nazionale di Ricerca Metrologica; Elio K. Bertacco, Istituto Nazionale di Ricerca Metrologica; Aldo Godone, Istituto Nazionale di Ricerca Metrologica; Giovanni A. Costanzo, Politecnico di Torino; Barbara Mongino, Politecnico di Torino; Steven R Jefferts, National Institute of Standards and Technology; Thomas P Heavner, National Institute of Standards and Technology; Elizabeth A Donley, National Institute of Standards and Technology

A New Trapped Ion Clock Based on 201Hg+ 774

S. Taghavi-Larigani, NASA Jet Propulsion Laboratory, California Institute of Technology; E.A. Burt, NASA Jet Propulsion Laboratory, California Institute of Technology; S.N. Lea, National Physical Laboratory; J.D. Prestage, NASA Jet Propulsion Laboratory, California Institute of Technology; R.L. Tjoelker, NASA Jet Propulsion Laboratory, California Institute of Technology

Sensors and Actuators

Acoustically Driven Microfluidic Applications for on-Chip Laboratories 778

Achim Wixforth, University of Augsburg

MEMS Viscosity Sensor 784

Arthur Ballato, US Army Communications-Electronics RDEC

Signal Generation & Processing

Timing and Spectral Properties of the Flying-Adder Frequency Synthesizers 788

Paul P. Sotiriadis, Sotekco Electronics LLC

Phase Noise Evaluation of DAC for Synthesizer Applications 793

J. Hellén, SAAB Microwave Systems; M. Oskarsson, SAAB Microwave Systems

Quantized Amplitudes in a Nonlinear Resonant Electrical Circuit 797

B. Cretin, FEMTO-ST Institute; D. Vernier, FEMTO-ST Institute

Study of SAW Chirp- Z Transform for an Enhancement of OFDM/OFDMA Systems 801

Takaya Watanabe, World Technology Instrument Co, Ltd

Fiber Links

Phase-Coherent Frequency Comparison of Optical Clocks Using a Telecommunication Fiber Link 807

H. Schnatz, Physikalisch-Technische Bundesanstalt; O. Terra, Physikalisch-Technische Bundesanstalt; K. Predehl, Physikalisch-Technische Bundesanstalt; T. Feldmann, Physikalisch-Technische Bundesanstalt; T. Legero, Physikalisch-Technische Bundesanstalt; B. Lipphardt, Physikalisch-Technische Bundesanstalt; U. Sterr, Physikalisch-Technische Bundesanstalt; G. Grosche, Physikalisch-Technische Bundesanstalt; K. Predehl, Max-Planck-Institute for Quantum Optics; T.W. Hänsch, Max-Planck-Institute for Quantum Optics; R. Holzwarth, Max-Planck-Institute for Quantum Optics; Th. Udem, Max-Planck-Institute for Quantum Optics; Z. Lu, Max-Planck-Institute for the Science of Light; L. Wang, Max-Planck-Institute for the Science of Light; W. Ertmer, University of Hanover; J. Friebe, University of Hanover; A. Pape, University of Hanover; E.-M. Rasel, University of Hanover; M. Riedmann, University of Hanover; T. Wübbena, University of Hanover

High-Resolution Optical Frequency Dissemination on a Telecommunication Network 813

Anne Amy-Klein, Laboratoire de Physique des Lasers Université Paris 13; Olivier Lopez, Laboratoire de Physique des Lasers Université Paris 13; Fabien Kéfélian, Laboratoire de Physique des Lasers Université Paris 13; Christian Chardonnet, Laboratoire de Physique des Lasers Université Paris 13; Haifeng Jiang, Observatoire de Paris; Giorgio Santarelli, Observatoire de Paris

Ultra Low Frequency Noise Laser Stabilized on Optical Fiber Spool 815

Haifeng Jiang, Observatoire de Paris; Pierre Lemonde, Observatoire de Paris; Giorgio Santarelli, Observatoire de Paris; Fabien Kéfélian, Laboratoire de Physique des Lasers Université Paris 13

Microcantilevers

Chemical Sensing Using Microcantilever without Sensitive Coating 818

Sébastien Tétin, Université de Bordeaux; Benjamin Caillard, Université de Bordeaux; Francis Ménil, Université de Bordeaux; Hélène Debéda, Université de Bordeaux; Claude Lucat, Université de Bordeaux; Claude Pellet, Université de Bordeaux; Isabelle Dufour, Université de Bordeaux

Specific Geometries of Resonant Cantilevers for Scanning Force Microscopy 822

Julian Le Rouzic, FEMTO-ST Institute; Bernard Cretin, FEMTO-ST Institute; Pascal Vairac, FEMTO-ST Institute; Bruno Cavallier, FEMTO-ST Institute

Resonant Languisite Microsensor for Atomic Force Microscopy 826

G. Douchet, FEMTO-ST Institute; F. Sthali, FEMTO-ST Institute; E. Bigler, FEMTO-ST Institute; R. Bourquin, FEMTO-ST Institute; T. Leblois, FEMTO-ST Institute

FEA Calculations on the Lateral Field Electroded Sensor 831

E.P. EerNisse, Quartzdyne, Inc; D. Puccio, Quartzdyne, Inc; R. Lucklum, Otto-von-Guericke University Magdeburg; U. Hempel, Institute for Automation and Communication

Timing Stability in Applications

The Allan Variance – Challenges and Opportunities	835
<i>Samuel R. Stein, Symmetricom, Inc</i>	

Optical Clocks III

Toward a Mercury Optical Lattice Clock: Spectroscopy of the Clock Transition in Fermionic Isotopes	840
<i>S. Mejri, Observatoire de Paris; M. Petersen, Observatoire de Paris; D.V. Magalhães, Universidade de Sao Paulo; C. Mandache, Observatoire de Paris and Plasmas and Radiation, Plasmas and Nuclear Fusion Laboratory; S. Dawkins, Observatoire de Paris; R. Chicireanu, Observatoire de Paris; Y. Le Coq, Observatoire de Paris; A. Clairon, Observatoire de Paris; S. Bize, Observatoire de Paris</i>	

Fluidic Sensors

Fluidic Sensors Based on Vibrating Miniaturized Devices	842
<i>Bernhard Jakoby, Johannes Kepler University Linz</i>	

Torsional Acoustic Waveguide Sensor for Temperature and Liquid Level	850
<i>William K. Spratt, University of Maine; John F. Vetelino, Laboratory for Surface Science and Technology and Department of Electrical Engineering</i>	

Simple Frequency-Based Sensing of Viscosity and Dielectric Properties of a Liquid Using Acoustic Resonators	855
<i>Diethelm Johannsmann, Clausthal University of Technology; Wendelin Bücking, Clausthal University of Technology; Berthold Bode, Flucon Fluid Control GmbH; Judith Petri, Clausthal University of Technology</i>	

A Love-Wave Sensor for Direct Detection of Biofunctionalized Nanoparticles	861
<i>L. El Fissi, Sensor; J-M. Friedt, Sensor; V. Luzet, FEMTO-ST; F. Chérioux, FEMTO-ST; G. Martin, FEMTO-ST; S. Ballandras, FEMTO-ST</i>	

Opto-Electronic Oscillators

High-Q Optical Resonators for Stabilization of High Spectral Purity Microwave Oscillators	866
<i>P.-H. Merrer, LAAS-CNRS; A. Bouchier, LAAS-CNRS; H. Brahimi, LAAS-CNRS; O. Llopis, LAAS-CNRS; G. Cibié, CNES</i>	

An Analytical Model of the Dual-Injection-Locked Opto-Electronic Oscillator (DIL-OEO)	870
<i>C.R. Menyuk, University of Maryland; E.C. Levy, Technion Israel Institute of Technology; O. Okusaga, University of Maryland Baltimore County and Army Research Laboratory; M. Horowitz, Technion Israel Institute of Technology; G.M. Carter, University of Maryland Baltimore County; W. Zhou, Army Research Laboratory</i>	

Experimental and Simulation Study of Dual Injection-Locked OEOs 875

*Olukayode Okusaga, US Army Research Laboratory; Weimin Zhou, US Army Research Laboratory;
Etgar Levy, Technion Israel Institute of Technology; Moshe Horowitz, Technion Israel Institute of
Technology; Gary Carter, University of Maryland Baltimore County; Curtis Menyuk, University of
Maryland Baltimore County*

**Photonic Millimeter-Wave Generation and Transmission System Applicable to the
High-Frequency Radio Interferometers 880**

*Hitoshi Kiuchi, National Astronomical Observatory of Japan; Tetsuya Kawanishi, National Institute of
Information and Communications Technology*

Materials, Filters & Resonators III

**Observation of Persistent Photoconductivity and Modified Permittivity in Bulk Gallium
Arsenide and Gallium Phosphide Samples at Cryogenic Temperatures 886**

*David Mouneyrac, University of Western Australia; John G. Hartnett, University of Western Australia;
Jean-Michel Le Floch, University of Western Australia; Michael E. Tobar, University of Western Australia;
Jerzy Krupka, Institute of Microelectronics and Optoelectronics; David Mouneyrac, XLIM UMR;
Dominique Cros, XLIM UMR*

Bulk Acoustic Wave Filter Synthesis and Optimization for UMTS Applications 890

*Sylvain Giraud, XLIM UMR; Stéphane Bila, XLIM UMR; Matthieu Chatras, XLIM UMR 6172;
Dominique Cros, XLIM UMR; Michel Aubourg, XLIM UMR*

Piezoelectric Aluminum Nitride Resonator for Oscillator 894

*O. Mareschal, NXP Semiconductors; S. Loiseau, NXP Semiconductors; A. Fougerat, NXP Semiconductors;
L. Valbin, ESIEE - ESYCOM; G. Lissorgues, ESIEE - ESYCOM; S. Saez, GREYC - CNRS;
C. Dolabdjian, GREYC - CNRS; R. Bouregba, CRISMAT - CNRS; G. Poullain, CRISMAT - CNRS*

An Acoustic Waveguide Based on Doubly-Bonded Silicon/PPT/Silicon Structures 898

*E. Courjon, FEMTO-ST; F. Bassignot, FEMTO-ST; G. Ulliac, FEMTO-ST; T. Laroche, FEMTO-ST;
J. Garcia, FEMTO-ST; D. Gachon, FEMTO-ST; S. Queste, FEMTO-ST; J-P. Romand, FEMTO-ST;
S. Ballandras, FEMTO-ST; R. Petit, CELAR, DGA*

Electrode Sizing for Guided Wave Resonator Above a Bragg Mirror 904

*Issiaka Kone, CEA, LETI, MINATEC; Alexandre Reinhardt, CEA, LETI, MINATEC; Frédéric Domingue,
CEA, LETI, MINATEC; Bertrand Dubus, CNRS UMR 8520; Lionel Buchaillot, CNRS UMR 8520;
Fabrice Casset, CEA, LETI, MINATEC; Jean François Carpentier, STMicroelectronics; Marc Aïd, CEA,
LETI, MINATEC*

High Frequency Crystal Monolithic Filter with High Power Level in Airborne Application 908

*Bertrand d'Albaret, AR-Electronique; Bernard Wolcoff, AR-Electronique; Séverine Michel, AR-Electronique;
Olivier Franquet, AR-Electronique; Philippe de Joffrey, AR-Electronique; Philippe Cappelle, AR-Electronique
Parc La Fayette*

Miniature Sapphire Acoustic Resonator (MSAR)	913
<i>Rabi T. Wang, California Institute of Technology; G. John Dick, California Institute of Technology; Robert L. Tjoelker, California Institute of Technology</i>	
Focus Adjustment System for a Fast-Scanning and Phase-Sensitive Laser Probe for Radio Frequency Surface and Bulk Acoustic Wave Devices	915
<i>Nan Wu, Chiba University; Keisuke Kashiwa, Chiba University; Ken-Ya Hashimoto, Chiba University; Tatsuya Omori, Chiba University; Masatsune Yamaguchi, Chiba University; Naoki Kasai, Neoark Co Ltd</i>	
Acoustic Wave Devices Using Periodical Poled Z-Cut LiTaO₃ Plate	919
<i>Michio Kadota, Murata Mfg Co, Ltd; Takashi Ogami, Murata Mfg Co, Ltd; Kansho Yamamoto, Murata Mfg Co, Ltd; Yasuo Cho, Tohoku University</i>	
Trial Production Result of MCF Adopted Narrow Band Radio Transceiver Module	923
<i>Hiroyuki Yamaguchi, Nihon Dempa Kogyo Co., Ltd; Kaoru Kobayashi, Nihon Dempa Kogyo Co., Ltd; Shinichi Satoh, Nihon Dempa Kogyo Co., Ltd; Masanobu Okazaki, Nihon Dempa Kogyo Co., Ltd</i>	
Relation Between Physical Processes and Aging	927
<i>Eberhard Seydel, Vectron International GmbH & Co KG</i>	
Design of IF Two-Track Filters Using IDT/(100) AlN/Diamond Structure	931
<i>Ruyen Ro, I-Shou University; Ruyue Lee, I-Shou University; Chia-Chi Sung, National Taiwan University; Yuan-Feng Chiang, National Taiwan University; Sean Wu, Tung-Fang Institute of Technology</i>	
Material Parameters of AlN and LiAlO₂ Single Crystals	935
<i>A.V. Sotnikov, Leibniz Institute for Solid State and Materials Research; H. Schmidt, Leibniz Institute for Solid State and Materials Research; M. Weihnacht, Leibniz Institute for Solid State and Materials Research; E.P. Smirnova, A.F. Ioffe Physical-Technical Institute of the Russian Academy of Sciences; T.Yu. Chemekova, Nitride Crystals Group; Yu.N. Makarov, Nitride Crystals Group</i>	
Electrical Control for Wet Etching of Quartz Resonators	939
<i>William Clower, Louisiana Tech University; Eric Rodrigue, Louisiana Tech University; Chester Wilson, Louisiana Tech University; Ville Kaajakari, Louisiana Tech University</i>	
DCS Tx Filters Using AlN Resonators with Iridium Electrodes	943
<i>M. Clement, Universidad Politécnica de Madrid; E. Iborra, Universidad Politécnica de Madrid; J. Olivares, Universidad Politécnica de Madrid; S. Giraud, Université de Limoges/CNRS; S. Bila, Université de Limoges/CNRS; N. Rimmer, Aviza Technology Inc; A. Reinhardt, CEA, LETI, MINATEC</i>	

Oscillators, Synthesizers & Noise II

Hybrid-Coupled Planar Resonator (HPCR) Arms Miniaturized Synthesizers	949
<i>Ajay K. Poddar, Synergy Microwave Corporation; Ulrich L. Rohde, Univ. of Cottbus</i>	
The Impact of Tuning Circuit Configuration on the Start-Up Time of Crystal Oscillators	956
<i>Mike F. Wacker, Vectron International</i>	

Tunable Active Inductor Offers Integrable and Cost-Effective Alternatives of Varactor Tuned VCOs	962
<i>Ulrich L. Rohde, Univ. of Cottbus; Ajay K. Poddar, Synergy Microwave Corporation</i>	
A Wide Frequency-Regulated Precision OCXO	968
<i>Wei Zhou, Xidian University; Yongbo Liu, Xidian University; Hui Zhou, Xidian University; Miao Miao, Xidian University</i>	
Measurements of Ultra-Stable Langatate Crystal Oscillators	970
<i>J. Imbaud, FEMTO-ST institute; S. Galliou, FEMTO-ST institute; J.P. Romand, FEMTO-ST institute; P. Abbé, FEMTO-ST institute; R. Bourquin, FEMTO-ST institute</i>	
An Improved Microcontroller Compensated Low Phase Noise Overtone TCXO	974
<i>Wei Fu, University of Electronic Science & Technology of China; Xianhe Huang, University of Electronic Science & Technology of China; Feng Tan, University of Electronic Science & Technology of China; Peng Dai, University of Electronic Science & Technology of China; Yan Wang, University of Electronic Science & Technology of China</i>	
The Method of Modeling of VCO Based on SPICE Simulation	978
<i>S.A. Zavjalov, Omsk State Technical University; A.N. Lepetaev, Omsk State Technical University; K.V. Murasov, Omsk State Technical University; A.V. Kosykh, Omsk State Technical University</i>	
Performance of Wireline Links Synchronized to Self-Referenced Solid-State Frequency Sources	982
<i>Michael S. McCorquodale, Mobius Microsystems, Inc; Dongtai Liu, Mobius Microsystems, Inc</i>	
Some Experiment Results of TCXO Based on Stress Processing	986
<i>Hui Zhou, Xidian University; Wei Zhou, Xidian University; Xueping Zhang, Xidian University; Miao Miao, Xidian University; Zi Ye, Zhejiang University</i>	
A Novel Method for Low-Power, High-Precision Time-keeping Based on MCXO	988
<i>Liang Chen, National University of Defence Technology; Jian Zhang, National University of Defence Technology; Xiaohu Yu, National University of Defence Technology; Gang Ou, National University of Defence Technology; Huihuang Chen, Xiamen University; Xianjun Zeng, Xiamen University</i>	
A MOS Temperature Compensation Function Generator for TCXO Using Differential MOS Multipliers	990
<i>Takehiko Adachi, Yokohama National University; Shoji Izumiya, Yokohama National University</i>	
Timekeeping, Optical & Microwave Atomic Standards II	
Discharge Lamps for Rb Atomic Clocks: The Role of rf-Power	994
<i>James Camparo, The Aerospace Corporation; Gilda Fathi, The Aerospace Corporation</i>	
Light Shift in Modulated Coherent Population Trapping Atomic Clocks	998
<i>Ke Deng, Peking University; Tao Guo, Peking University; Juan Su, Peking University; Dengzhu Guo, Peking University; Xuzong Chen, Peking University; Zhong Wang, Peking University</i>	

Improving Short and Long Term Stability of Pulsed Optically Pumped Vapor Cell Frequency Standards	1001
<i>S. Micalizio, Istituto Nazionale di Ricerca Metrologica; A. Godone, Istituto Nazionale di Ricerca Metrologica; F. Levi, Istituto Nazionale di Ricerca Metrologica; C. Calosso, Istituto Nazionale di Ricerca Metrologica</i>	
New Method for Light-Shift Elimination	1005
<i>B.H. McGuyer, Princeton University; Y.-Y. Jau, Princeton University; W. Happer, Princeton University</i>	
Cs Buffer Gas Collisional Frequency Shift: Method and Preliminary Measurements	1009
<i>O. Kozlova, Observatoire de Paris; R. Boudot, FEMTO-ST Institute; S. Guérandel, Observatoire de Paris; E. De Clercq, Observatoire de Paris</i>	
Space Cold Atom Clock with Counter-Propagating Atoms	1013
<i>Desheng Lu, Shanghai Institute of Optics and Fine Mechanics; Bin Wang, Shanghai Institute of Optics and Fine Mechanics; Tang Li, Shanghai Institute of Optics and Fine Mechanics; Liang Liu, Shanghai Institute of Optics and Fine Mechanics</i>	
Microfabrication of 85Rb Vapor Cell for Chip-Scale Atomic Clocks	1016
<i>Juan Su, Peking University; Ke Deng, Peking University; Zhong Wang, Peking University; Deng-zhu Guo, Peking University</i>	
Investigation on Physics Package with Slotted-Tube Microwave Cavity for Rubidium Atomic Frequency Standard	1019
<i>Da Zhong, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences; Baihua Xia, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences; Shaofeng An, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences; Hanhua Wu, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences; Qin Wang, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences; Feng Zhao, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences; Feng Qi, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences; Fang Wang, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences; Ganghua Mei, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences</i>	
Progress of the Fountain Frequency Standard at NMIJ in 2008	1023
<i>S. Yanagimachi, National Metrology Institute of Japan; A. Takamizawa, National Metrology Institute of Japan; K. Watabe, National Metrology Institute of Japan; K. Hagimoto, National Metrology Institute of Japan; T. Ikegami, National Metrology Institute of Japan</i>	
Microwave Leakage Shift Suppression Based on Home Made DDS	1026
<i>Pingwei Lin, National Institute of Metrology; Shi Liu, National Institute of Metrology; Nianfeng Liu, National Institute of Metrology</i>	
A Proposal for Optical High-Accuracy Atomic References Using Thin Cell Spectroscopy	1030
<i>N. Beverini, Università di Pisa; A.Ch. Izmailov, Azerbaijan National Academy of Sciences</i>	

Brazilian Microwave Standards of Time and Frequency	1035
--	-------------

Renato Ferracini Alves, Universidade de São Paulo; Stella Torres Müller, Universidade de São Paulo; Aida Bebeachibuli, Universidade de São Paulo; Diego Lencione, Universidade de São Paulo; Vanderlei Salvador Bagnato, Universidade de São Paulo; Daniel Varela Magalhães, Universidade de São Paulo

Sensors & Transducers II

Quartz Crystal Oscillator Sensor for QCM Monitoring of Water Absorption in Anticorrosion Cataphoretic Paintings	1038
--	-------------

L. Rodriguez-Pardo, University de Vigo; A. Cao-Paz, University de Vigo; J. Fariña, University de Vigo; A. Covelo, University de Vigo; X.R. Nóvoa, University de Vigo; C. Pérez, University de Vigo

Density and Viscosity Measurements of Room Temperature Ionic Liquids Using Patterned Quartz Crystal Microbalances	1043
--	-------------

N. Doy, Nottingham Trent University; G. McHale, Nottingham Trent University; M.I. Newton, Nottingham Trent University; C. Hardacre, Queens University Belfast; R. Ge, Queens University Belfast; R.W. Allen, University of Sheffield; J.M. Macinnes, University of Sheffield

Love Waves in Functionally Graded Piezoelectric Material Structures Loaded with Viscous Liquid	1046
---	-------------

Jianke Du, Ningbo University; Kai Xian, Ningbo University; Yook-Kong Yong, Rutgers University; Ji Wang, Ningbo University

Study of Piezoelectric Transducer for Liquid Ejection	1050
--	-------------

S.F. Hon, Hong Kong Polytechnic University; K. W. Kwok, Hong Kong Polytechnic University

Combination of Surface Acoustic Wave Measurement and Impedance Spectroscopy for Detection of Cell Adhesion Process	1055
---	-------------

G. Guhr, Leibniz Institute for Solid State and Materials Research Dresden; R. Brünig, Leibniz Institute for Solid State and Materials Research Dresden; H. Schmidt, Leibniz Institute for Solid State and Materials Research Dresden; M. Jäger, Dresden University of Technology; R. Poll, Dresden University of Technology; M. Weihnacht, InnoXacs

On-Line Surveillance of Lubricants in Bearings by Means of Surface Acoustic Waves	1058
--	-------------

G. Lindner, Coburg University of Applied Sciences, Coburg University of Applied Sciences; H. Faustmann, Institute of Sensor and Actuator Technology, Coburg University of Applied Sciences; S. Krempel, Institute of Sensor and Actuator Technology, Coburg University of Applied Sciences; M. Schmitt, Institute of Sensor and Actuator Technology, Coburg University of Applied Sciences; J. Schubert, Institute of Sensor and Actuator Technology, Coburg University of Applied Sciences

Time & Frequency Measurement & Transfer II

A Fiber Based Frequency Distribution System with Enhanced Output Phase Stability	1061
<i>Sven-Christian Ebenhag, SP Technical Research Institute of Sweden; Per Olof Hedekvist, SP Technical Research Institute of Sweden; Carsten Rieck, SP Technical Research Institute of Sweden; Håkan Skoogh, SP Technical Research Institute of Sweden; Per Jarlemark, SP Technical Research Institute of Sweden; Kenneth Jaldehag, SP Technical Research Institute of Sweden</i>	
Influence of Troposphere in PPP Time Transfer	1065
<i>Q. Baire, Royal Observatory of Belgium; P. Defraigne, Royal Observatory of Belgium; E. Pottiaux, Royal Observatory of Belgium</i>	
Performance of Time Transfer Using Compass Satellite	1069
<i>Sun Hongwei, Xi'an University of Arts and Science; Yuan Haibo, National Time Service Center; Zhang Hong, National Time Service Center</i>	
Measurement of the Time Delay of GPS Timing Receiver Based on UTC(NTSC)	1073
<i>Xiaohui Li, National Time Service Center, Chinese Academy of Sciences; Huijun Zhang, National Time Service Center, Chinese Academy of Sciences; Shaohua Shi, National Time Service Center, Chinese Academy of Sciences; Guoqiang Wang, Huanghuai University</i>	
Concept for an Accurate Calibration of Long Baseline Two-Way Satellite Time and Frequency Transfer (TWSTFT) Links via Two Separated Transponders on One Telecommunication Satellite	1076
<i>D. Piester, Physikalisch-Technische Bundesanstalt; T. Feldmann, Physikalisch-Technische Bundesanstalt; A. Bauch, Physikalisch-Technische Bundesanstalt; M. Fujieda, National Institute of Information and Communications Technology; T. Gotoh, National Institute of Information and Communications Technology</i>	
Progress to Coherent Frequency Transfer Over a Telecom Fiber Link at NICT	1082
<i>Miho Fujieda, National Institute of Information and Communications Technology; Motohiro Kumagai, National Institute of Information and Communications Technology; Shigeo Nagano, National Institute of Information and Communications Technology; Ying Li, National Institute of Information and Communications Technology</i>	
Design and Analysis of High Dynamic CAPS Signal Simulation Testing System	1087
<i>Hong-Jiao Ma, National Time Service Center, Chinese Academy of Sciences; Yong-Hui Hu, National Time Service Center, Chinese Academy of Sciences; Jian-Feng Wu, National Time Service Center, Chinese Academy of Sciences; Fei-Jiang Huang, National Time Service Center, Chinese Academy of Sciences; Hong Zhang, National Time Service Center, Chinese Academy of Sciences</i>	
Mathematical Modeling and Simulation on Inter-Orbit-Links in Treble-Layer Satellite Network	1091
<i>Tao Han, Chinese Academic of Sciences and Northwest University; Jihong Dou, Northwest University; Xiaochun Lu, National Time Service Center, Chinese Academy of Sciences; Hang Zhao, National Time Service Center, Chinese Academy of Sciences</i>	

Time and Frequency Transfer Through a Network of GNSS Receivers Located in Timing Laboratories	1097
<i>G. Cerretto, INRIM; A. Perucca, INRIM; P. Tavella, IMRIM; A. Mozo, GMV; R. Píriz, GMV; M. Romay, GMV</i>	
Real-Time MTIE Assessment with Flexible Control of Computation Process	1102
<i>Andrzej Dobrogowski, Poznan University of Technology; Michal Kasznia, Poznan University of Technology</i>	
A Short Time Signal Generating Method Based on Time Comb Principle	1108
<i>Hai Wang, Xidian University; Wei Zhou, Xidian University; Li Li, CAST</i>	
Study on a New Time Transfer Method by Digital Satellite TV Signal Broadcasting	1111
<i>Wei Guo, National Time Service Center, Chinese Academy of Sciences; Yu Hua, National Time Service Center, Chinese Academy of Sciences; Ke-xin Song, National Time Service Center, Chinese Academy of Sciences; Ting Cao, National Time Service Center, Chinese Academy of Sciences</i>	
Error Correction of Precise Time Transfer Experiment Between Ground and ETS-VIII	1114
<i>Yasuhiro Takahashi, National Institute of Information and Communications Technology; Maho Nakamura, National Institute of Information and Communications Technology; Fumimaru Nakagawa, National Institute of Information and Communications Technology; Ryo Tabuchi, National Institute of Information and Communications Technology; Jun Amagai, National Institute of Information and Communications Technology; Shigeru Tsuchiya, National Institute of Information and Communications Technology; Shin'ichi Hama, National Institute of Information and Communications Technology; Hiroyuki Noda, Japan Aerospace Exploration Agency</i>	
Measuring Method for Carrier Phase Based on Phase Difference Group Processing	1119
<i>Zhiqi Li, Xidian University; Wei Zhou, Xidian University; Hai Wang, Xidian University; Xueping Zhang, Xidian University; Guangyun Yu, Xidian University; Ximing Zhang, Xidian University</i>	
Precise Two Way Time Synchronization for Distributed Satellite System	1122
<i>Gun Li, University of Electronic Science & Technology of China; Feijiang Huang, National Time Service Center, Chinese Academy of Sciences</i>	
Submicrosecond Filtering of Packet Delay Variation in Video Stream Over IP Metropolitan Area Network	1127
<i>Gilles Boime, Spectracom/Orolia s.a.; Jérôme Dromer, Spectracom/Orolia s.a.; John Fischer, Spectracom Corp</i>	
A Two-Stage Time-to-Digital Converter Based on Cyclic Pulse Shrinking	1133
<i>Ryszard Szplet, Military University of Technology; Kamil Klepacki, Military University of Technology</i>	
GNSS Clock Prediction and Integrity	1137
<i>Francisco Gonzalez Martinez, Karlsruhe University; Pierre Waller, European Space Agency</i>	
Progress in Portable Instrumentation for Time Source Verification and Analysis	1143
<i>Nigel Helsby, Time & Frequency Solutions Ltd; William Dean, Industrial Computing Ltd</i>	

Aces Ground Segment Functionality and Preliminary Operational Concept	1146
<i>E. Daganzo, European Space Agency; S. Feltham, European Space Agency; R. Much, European Space Agency; R. Nasca, European Space Agency; R. Stalford, Astrium Space Transportation; M.P. Hess, Astrium Space Transportation; L. Stringhetti, Astrium Space Transportation; L. Cacciapuoti, European Space Agency</i>	

Time Comparison Using Cs-Clocks, Uncertainty Evaluation	1153
<i>Kalevi Kalliomäki, MIKES; Tapio Mansten, MIKES; Ilkka Iisakka, MIKES</i>	

TFTS: a Transfer Standard for Frequency and Time Interval Inter-Laboratory Comparisons	1158
<i>C.E. Calosso, Istituto Nazionale di Ricerca Metrologica; V. Pettiti, Istituto Nazionale di Ricerca Metrologica; F. Cordara, Istituto Nazionale di Ricerca Metrologica; E.K. Bertacco, Istituto Nazionale di Ricerca Metrologica; D. Orgiazzi, Unknown</i>	

Optical Frequency Standards & Applications II

Referencing Femtosecond Laser Frequency Combs to a He-Ne/CH₄ Optical Frequency Standard	1163
<i>Evgeny V. Kovalchuk, Humboldt-Universität zu Berlin; Achim Peters, Humboldt-Universität zu Berlin</i>	

Back Ground Gas Induced Collision Shift for 88Sr: 1S0-3P1 Transition	1166
<i>Tetsuya Ido, National Institute of Information and Communications Technology; Nobuyasu Shiga, National Institute of Information and Communications Technology; Ying Li, National Institute of Information and Communications Technology; Hiroyuki Ito, National Institute of Information and Communications Technology; Shigeo Nagano, National Institute of Information and Communications Technology; Mizuhiko Hosokawa, National Institute of Information and Communications Technology; Katarzyna Bielska, Uniwersytet Mikołaja Kopernica; Ryszard S. Trawinski, Uniwersytet Mikołaja Kopernica; Roman Ciurylo, Uniwersytet Mikołaja Kopernica</i>	

An Archetype Semi-Ring Fabry-Perot (SRFP) Resonator	1169
<i>Sheroin Taghavi-Larigani, Jet Propulsion Laboratory California Institute of Technology; Jakob VanZyl, Jet Propulsion Laboratory California Institute of Technology</i>	

High Resolution Rotation Sensor Based on Cold Rubidium Atoms	1173
<i>Michael Gilowski, Leibniz University of Hanover; Christian Schubert, Leibniz University of Hanover; Thijs Wendrich, Leibniz University of Hanover; Peter Berg, Leibniz University of Hanover; Gunnar Tackmann, Leibniz University of Hanover; Wolfgang Ertmer, Leibniz University of Hanover; Ernst Maria Rasel, Leibniz University of Hanover</i>	

Industrial Devices

Autonomously Measuring an Atomic Clock's Allan Variance	1176
<i>J. Camparo, The Aerospace Corporation; Y. Chan, The Aerospace Corporation; W. Johnson, The Aerospace Corporation; S. Karuza, The Aerospace Corporation; A. Young, The Aerospace Corporation</i>	

A Microfabricated Photonic Magnetometer	1180
<i>Jan Preusser, NIST; Svenja Knappe, NIST; John Kitching, NIST; Vladislav Gerginov, PTB</i>	

Application of Reduced Light Shift Optical Pumping Method to Chip Scale Atomic Clock 1183

M. Zhu, Agilent Laboratories; J. DeNatale, Teledyne Scientific Company

Optical Clocks IV

Optimization of the Dick Effect in an Optical Lattice Clock 1187

Philip G. Westergaard, Observatoire de Paris, CNRS, UPMC; Jérôme Lodewyck, Observatoire de Paris, CNRS, UPMC; Pierre Lemonde, Observatoire de Paris, CNRS, UPMC

Two-Way & GNSS Time & Frequency Transfer

Fully Use the Redundancy in TWSTFT and GNSS Time and Frequency Transfer 1194

Z. Jiang, Bureau International des Poids et Mesures

Improving TWSTFT Short-Term Stability by Network Time Transfer 1198

Wen-Hung Tseng, Telecommunication Laboratories; Shinn-Yan Lin, Telecommunication Laboratories; Kai-Ming Feng, National Tsing Hua University; Miho Fujieda, National Institute of Information and Communications Technology; Hideo Maeno, National Institute of Information and Communications Technology

The Comparison Between TWSTFT and GPS Time Transfer Result of PTB-TL LINK 1203

Shinn-Yan Lin, Telecommunication Laboratories; Wen-Hung Tseng, Telecommunication Laboratories; Huang-Tien Lin, Telecommunication Laboratories; Kai-Ming Feng, National Tsing Hua University; Dirk Piester, Physikalisch-Technische Bundesanstalt

TWSTFT Activities at NTSC 1206

Hong Zhang, National Time Service Center; Huanxin Li, National Time Service Center; W. Lewandowski, Bureau International des Poids et Mesures; Z. Jiang, Bureau International des Poids et Mesures

Results of the 2008 TWSTFT Calibration of Seven European Stations 1209

Andreas Bauch, Physikalisch-Technische Bundesanstalt; Dirk Piester, Physikalisch-Technische Bundesanstalt; Bernd Blanzano, Joanneum Research Forschungsgesellschaft m.b.H.; Otto Koudelka, Joanneum Research Forschungsgesellschaft m.b.H.; Erik Kroon, Van Swinden Laboratory; Erik Dierikx, Van Swinden Laboratory; Peter Whibberley, National Physical Laboratory; Joseph Achkar, LNE-SYRTE, Observatoire de Paris; Daniele Rovera, LNE-SYRTE, Observatoire de Paris; Luca Lorini, INRiM; Franco Cordara, INRiM; Christian Schlunegger, METAS