19th IMEKO TC4 Symposium Measurements of Electrical Quantities 2013 (and 17th International Workshop on ADC and DAC Modelling and Testing)

Barcelona, Spain
18 – 19 July 2013

ISBN: 978-1-62993-189-0

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571

Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2013) by the International Measurement Federation (IMEKO)
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact the International Measurement Federation (IMEKO)
at the address below.

IMEKO-International Measurement Federation Secretariat
P.O. Box 457
H-1371 Budapest
Hungary

Phone/Fax: +36 1 353 1562

imeko@t-online.hu

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

ELECTROCHEMICAL HYBRID BIO-SENSORS FOR NEUROTRANSMITTERS ANALYSIS 1
C. Schreiner, G. Dimofte, T. Schreiner

USING AN IEEE1149.1 TEST BUS FOR FAULT DIAGNOSIS OF ANALOG PARTS OF ELECTRONIC EMBEDDED SYSTEMS 6
Z. Czaja, B. Bartosinski

TRANSIENT REDUCTION IN PULSE-BASED IMPEDANCE MEASUREMENTS 12
C. Aliau-Bonet, R. Pallas-Areny

INTERLABORATORY COMPARISON OF MICROWAVE POWER MEASUREMENT USING TYPE N COAXIAL LINE 18
M. Celep, S. Yaran, C. Hayirli, H. Sakarya

CALIBRATION OF MAGNETIC FIELD METERS UP TO 50 KHZ AT CMI 20
M. Ulvr

MEASUREMENT OF FREQUENCY DEPENDENCES OF LOW-VALUE FOUR-TERMINAL RESISTANCE STANDARDS 26
J. Bohacek

ASSESSMENT OF THE UNCERTAINTY ASSOCIATED WITH SYNCHRONIZATION ERROR IN ANALOG TO DIGITAL CONVERSION WITH DITHER AND CAV 30
A. Domanska

ESTIMATION OF THE AMPLITUDE QUOTIENT OF SIGNALS WITH COMMON FREQUENCY 35
T. Lusin, D. Agrez

EVALUATION OF THE UNCERTAINTY OF CALIBRATION OF THE THREE PHASE HIGH PRECISION COMPARATOR OF THE ELECTRICAL POWER 41
O. Velychko, S. Karpenko, V. Gachok

STUDY AND CHARACTERIZATION OF A MICROCALORIMETER THERMOSTAT 47
L. Oberto, L. Brunetti, C. Calosso

CALIBRATION OF LOW-CURRENT METERS AT NA LEVEL WITH THE CAPACITANCE-CHARGING METHOD 51
L. Callegaro, V. D'Elia

INVESTIGATION OF PLANAR COIL FOR EDDY CURRENT CONDUCTIVITY MEASUREMENTS IN WIDE FREQUENCY RANGE 55
M. Parker, A. Pokatilov, T. Kubarsepp, O. Martens, A. Kolyshkin

CALIBRATION SYSTEM FOR ELECTRIC CHARGE AT THE CENTRO ESPAÑOL DE METROLOGÍA 60
F. Raso, M. Cervantes

A STUDY ON THE POTENTIAL USE OF COMMERCIAL DIGITAL TWO-PHASE GENERATORS IN IMPEDANCE COMPARISON BRIDGES 64
K. Musiol, A. Met, M. Kampik

EXTENDING THE SCALE OF INDUCTANCE USING 1:1 COMPARATOR BRIDGE 68
K. Musiol, T. Skubis

ULTRASONIC TIME OF FLIGHT ESTIMATION FOR WIND SPEED MEASUREMENT BASED ON TIME-FREQUENCY DOMAIN USING STFT 72
R. Duarte, J. Villanueva, M. Costa, R. Freire, S. Catunda, W. Costa

EXPERIMENTAL EVALUATION OF POTENTIAL DISTRIBUTION IN A GROUNDING GRID SUBJECTED TO IMPULSE CURRENT 77
M. Castro, R. Freire, E. Costa, E. Macedo, N. Fonseca, T. Silva

A PORTABLE AND LOW COST SOLUTION FOR EMG USING ZIGBEE,GPRS AND INTERNET TO BIOMEDICAL APPLICATIONS 81
D. Silva, R. Sato, A. Castro

IMPROVING THE SINGLE POINT CALIBRATION TECHNIQUE IN DIRECT SENSOR-TO-MICROCONTROLLER INTERFACE 87
Z. Kokolanski, C. Gavrovski, V. Dimcev

QUASI-ANALYTICAL DESIGN OF A SQUARE HELMHOLTZ COIL WITH FINITE CROSS-SECTIONAL AREA AS A MAGNETIC FLUX DENSITY STANDARD 92
S. Somkun, T. Borirak-Arawin

HUMIDITY DETECTION IN SUGAR CANE SAMPLES USING MICROWAVES 98
G. Olmos, R. Melendez, A. Becerra, A. Godinez, M. Garza

AVERAGE VALUE EVALUATION OF THE DISTORTED PULSE SIGNAL 102
J. Hribik, M. Boris, P. Fuchs
A METHOD FOR ESTIMATING STATE OF CHARGE IN ENERGY-AWARE WIRELESS SENSOR NODES 108
G. Giorgi, A. Veronese, L. Corradini
AUTOMATIC AND SYSTEMATIC CONTROL OF EXPERIMENTAL DATA MEASUREMENTS ON ASICS 114
E. Tena, J. Castro, A. Acosta
DETECTION AND CHARACTERIZATION OF OSCILLATORY TRANSIENT USING SPECTRAL KURTOSIS 120
J. Sierra-Fernandez, J. Rosa, A. Aguera-Perez, J. Palomares-Salas
DETECTION AND CHARACTERIZATION OF AMPLITUDE DEFECTS USING SPECTRAL KURTOSIS 126
J. Sierra-Fernandez, J. Rosa, A. Aguera-Perez, J. Palomares-Salas
DSP BASED DATA ACQUISITION SYSTEM WITH ON-BOARD PROCESSING 132
P. Pinto, J. Gouveia, P. Ramos
IMPROVING THE CONVERGENCE OF GENE EXPRESSION PROGRAMMING IN IMPEDANCE SPECTROSCOPY 138
P. Ramos, F. Janeiro
SMART POSTURAL MONITOR FOR ELDERLY PEOPLE 144
V. Lecce, C. Guaragnella, R. Dario, T. D'Orazio
ARCHITECTURE OF THE MULTI-TAP-DELAY-LINE TIME-INTERVAL MEASUREMENT MODULE IMPLEMENTED IN FPGA DEVICE 150
M. Zielinski, M. Gurski, D. Chaberski
IMPEDANCE SIMULATOR FOR AUTOMATIC CALIBRATION OF LCR METERS: PROOF-OF-PRINCIPLE EXPERIMENT 156
F. Overney, B. Jeanneret
UNIVERSAL LABORATORY MEASUREMENT SYSTEM FOR EVALUATION OF THE IMPEDANCE SPECTROSCOPY METHOD BASED ON MULTI-HARMONIC EXCITATION SIGNAL 161
J. Hoja, M. Kowalewski, G. Lentka
POWER PROFILE GENERATOR FOR THE TEST OF MICROGRID MEASUREMENT AND CONTROL SYSTEMS 166
M. Bertocco, G. Giorgi, C. Narduzzi
GEOMETRIC FEATURE EXTRACTION FOR PRECISE MEASUREMENTS IN INTRAMEDULLARY NAIL IMAGES 172
A. Skembris, E. Koukoutsis, C. Papaodysseus, E. Kayafas
MODEL OF ERRORS CAUSED BY DISCREPANCIES OF INPUT CHANNELS IN MULTIRESOLUTION ADC 178
M. Kamensky, K. Kovac, G. Valky
ELECTROMECHANICAL CHARACTERIZATIONS OF MEMS BASED ENERGY HARVESTERS BY HARMONIC SAMPLING ANALYSIS METHOD 184
A. Bounouh, D. Belieres
A NOVEL BLIND ADAPTIVE CORRECTION ALGORITHM FOR 2-CHANNEL TIME-INTERLEAVED ADCS 188
S. Singh, G. Vallant, M. Epp, M. Valkama, W. Schlecker
ULTRAPURE SINEWAVE GENERATION BY COMBINING JOSEPHSON SYSTEMS 194
L. Palafox, R. Behr, O. Kiehler, F. Ahlers
CONTACTLESS MEASUREMENTS FOR ON LINE QUALITY MONITORING IN RUBBER EXTRUSION PROCESSES 197
C. Leo, C. Liguori, A. Paolillo, A. Pietrosanto
CLOUD NOWCASTING: MOTION ANALYSIS OF ALL-SKY IMAGES USING VELOCITY FIELDS 203
Y. Gonzalez, C. Lopez, E. Cuevas
INFLUENCE OF GPS MEASUREMENTS QUALITY TO NTP TIME-KEEPING 208
V. Ogrizovic, J. Gucevic, S. Delcev
METAL PLATE THICKNESS CLASSIFICATION IN EDDY CURRENT TESTING USING SUPPORT VECTOR MACHINE 213
T. Rocha, D. Pasadas, H. Ramos, A. Ribeiro
ECT CHARACTERIZATION OF A LINEAR DEFECT FROM MULTIPLE ANGLE MEASUREMENTS 218
D. Pasadas, T. Rocha, A. Ribeiro, H. Ramos

THRESHOLD ESTIMATION IN LEAST-SQUARES ERROR FUNCTIONS: APPLICATION TO IMPEDANCE SPECTROSCOPY 222
F. Janeiro, P. Ramos
TIME-SYNCHRONOUS SAMPLING IN WIRELESS SENSOR NETWORKS 228
J. Funck, C. Guhmann
SYNCHRONIZATION OF DLMS/COSEM SENSOR NODES 234
A. Attianese, A. Giudice, M. Landi, V. Paciello, A. Pietrosanto
LOW-FREQUENCY NOISE MEASUREMENT IN SILICON POWER MOSFETS AS A TOOL TO EXPERIMENTALLY INVESTIGATE THE DEFECTIVENESS OF THE GATE OXIDE 240
P. Magnone, P. Traverso, G. Barletta, C. Fiegna
A NOVEL CAPACITANCE-TO-DIGITAL CONVERTER FOR CAPACITIVE SENSORS WITH AC EXCITATION 246
P. Vooka, A. Ranjan, B. George
A NEW CAPACITANCE-TO-DIGITAL CONVERTER SUITABLE FOR HUMAN PROXIMITY SENSING 250
A. Ranjan, B. George
DEVELOPMENT OF ELECTROCHEMICAL NANO-BIOSENSORS WITH DISTRIBUTED METAL PARTICLES 255
C. Schreiner, T. Krasia-Christoforou, C. Bratescu, R. Burlacu, M. Demetriou, I. Savva, R. Ciobanu
IMPEDANCE ESTIMATION OF A VIBRATING WIRE VISCOSITY SENSOR USING MULTI-HARMONIC SIGNALS 259
J. Santos, P. Ramos
DOUBLE QUASI - BALANCED METER FOR MEASUREMENT OF INDUCTOR QUALITY FACTOR 265
A. Cichy, A. Skorkowski, S. Barwinek
TRACEABILITY FOR AEROSOL ELECTROMETER IN THE FA RANGE 270
D. Jarrett, M. Owen
AUTOMATED QUASI-BALANCING IN VIRTUAL QUASI-BALANCED CIRCUIT DESIGNED TO CAPACITANCE MEASUREMENTS 275
A. Cichy, A. Skorkowski, S. Barwinek
WATER FRACTION MEASUREMENT USING A RF RESONANT CAVITY SENSOR 281
H. Avila, D. Pagano, F. Sousa
LANDSLIDE TRANSDUCER BASED ON AMORPHOUS WIRE STRAIN GAUGES 286
C. Zet, C. Fosalau, D Petrisor, C. Damian
VIRTUAL INSTRUMENT FOR POWER QUALITY RESEARCH 290
V. Dimcev, Z. Kokolanski, D. Taskovski
LONG-TERM MONITORING OF PHOTOVOLTAIC PLANTS 295
A. Carullo, F. Ferraris, A. Vallan, F. Spertino, F. Attivissimo
OPERATORS TO CALCULATE THE DERIVATIVE OF DIGITAL SIGNALS 301
L. Ferrer-Arnau, J. Mon-Gonzalez, V. Parisi-Baradad
CRACK SIZE IDENTIFICATION AND LOCATIZATION USING ULTRASONIC SENSORS WITH STATIONARY WAVELET TRANSFORM AND HILBERT TRANSFORM 307
N. Ingaroca, J. Villanueva, R. Freire, T. Batista
NEW EFFECTIVE ARCHITECTURES AND CONVERSION ALGORITHMS FOR ADAPTIVE SUB-RANGING A/D CONVERTERS 313
K. Jedrzejewski
WIRELESS INTELLIGENT SYSTEMS FOR BIOSIGNALS MONITORING USING LOW COST DEVICES 319
M. Branzila, V. David
LOW COST SMART SENSORS FOR AN INTELLIGENT HOME 323
M. Branzila, C. Sarmasanu
UNCERTAINTLY TO HARMONIC MEASUREMENTS WITH DFT TECHNIQUES 327
M. Pinto, N. Foiatto, J. Roehe, M. Stemmer
MULTI-CHANNEL SYSTEM FOR REMOTE POWER QUALITY MONITORING OF ELECTRICITY SUPPLIED BY PUBLIC DISTRIBUTION NETWORKS 333
A. Nikolic, B. Babic, A. Zigic, N. Miladinovic, S. Milosavljevic
CHARACTERIZATION OF THE PROPAGATION CHANNEL ABOARD TRAINS 339
A. Mariscotti, A. Marrese, N. Pasquino, R. Moriello
TIME DOMAIN PROCESSING OF PULSED DIFFERENTIAL EDDY CURRENTS TESTING SIGNALS 345
L. Rosado, P. Ramos, M. Piedade

THERMAL CONVERTER LEVEL DEPENDENCE DETERMINATION BY DIGITAL SAMPLING 351
A. Lourenco, R. Santos, J. Rois
A NEW PEAK DETECTOR BASED ON USAGE OF CCCIIS 356
P. Petrovic
A MAGNETIC FIELD PROBE FOR HOSTILE ENVIRONMENTS 362
M. Canepa, A. Mariscotti
A NUMERICAL METHOD FOR CORRECTING THE INFLUENCE OF THE ADDITIONAL QUANTITIES FOR NONSELECTIVE SENSORS 367
H. Urzedniczok
IDENTIFICATION OF WIRE NETWORK TOPOLOGY USING IMPEDANCE SPECTROSCOPY 372
Q. Shi, O. Kanoun
MODELING THE NON-STATIONARY BEHAVIOUR OF TIME-VARYING ELECTRICAL BIOIMPEDANCE 378
B. Sanchez, E. Louarroudi, R. Pintelon, R. Bragos
A METHOD FOR RESTRAINING ELECTROMAGNETIC INTERFERENCE OF ELECTRICITY METER BY MEANS OF PULSE WIDTH TESTING CIRCUIT 385
W. Liu, C. Song, J. Zhao
DESIGN AND MEASUREMENT OF THE NH LEVEL MUTUAL INDUCTOR 389
J. Zhang, W. Liu, X. Pan, J. Liu, B. Wang, Q. He
DESIGN OF SEISMIC ACQUISITION SYSTEM FOR VOLCANOLOGY 391
N. Carreras, A. Lazaro, S. Gomariz
UNCERTAINTY FACTORS IN TIME-INTERVAL MEASUREMENTS IN BALLISTOCARDIOGRAPHY 395
J. Gomez-Clapers, A. Serra-Rocamora, R. Casanella, R. Pallas-Areny
HYPOTHESIS TEST ON THE RATIO BETWEEN TWO MEASUREMENT UNCERTAINTIES 400
A. Zanobini, L. Ciani, M. Catelani
DESIGN AND IMPLEMENTATION OF AN AUTOMATIC MEASUREMENT SYSTEM FOR THE CHARACTERIZATION OF POWER MOSFETS 405
M. Catelani, L. Ciani
ON THE USE OF COMPLEX EXCITATION SEQUENCES FOR EDDY CURRENT TESTING 410
G. Betta, P. Burrascano, L. Ferrigno, M. Laracca, M. Ricci, G. Silipigni
MEASURING SYSTEM AND POWER MANAGEMENT OF THE GUANAY II AUV 416
I. Masmitja, J. Gonzalez, G. Masmitja, S. Gomariz, J. Del-Rio-Fernandez
DECIMATOR FILTER BASED ON B-SPLINES 421
L. Ferrer-Arnau, X. Roset, J. Mon-Gonzalez, V. Parisi-Baradad
ADVANCED PARAMETER MEASUREMENT OF ENERGY STORAGE SYSTEMS FOR SMART GRIDS APPLICATION 426
D. Gallo, C. Landi, M. Luiso, A. Rosano
THERMAL AC VOLTAGE STANDARDS WITH CALCULABLE AC-DC TRANSFER DIFFERENCE IN FREQUENCY RANGE FROM 10 KHZ TO 1 MHZ 432
M. Kampik, M. Grzenik
LOW POWER AND HIGH EFFIENCY ENERGY ACQUISITION SYSTEMS FOR VOLCANO MONITORING 436
D. Moure, P. Torres
MEASUREMENT TECHNIQUE FOR ONLINE EV BATTERY STATE OF LIFE MONITORING 440
G. Gross, M. Landi, C. Liguori, V. Paciello
ELECTRICAL IMPEDANCE SPECTROSCOPY CELL MONITORING IN A MINIATURIZED BIOREACTOR 446
J. Martinez-Teruel, T. Garcia-Sanchez, A. Fontova, R. Bragos
THE ANALYSIS OF EXPONENTIAL SIGNALS BY MAXIMUM LIKELIHOOD ESTIMATION 451
L. Michaeli, M. Godla, J. Saliga, J. Liptak, I. Kollar
APPLICATION OF INTELLIGENT INSTRUMENTS FOR THE MONITORING OF THRUST REVERSE NOISE AT AIRPORTS 457
C. Asensio, M. Ruiz, M. Recuero, G. Moschioni, M. Tarabini
TAKING ADVANTAGE OF MACHINE LEARNING AND PATTERN RECOGNITION IN ACOUSTIC MEASUREMENTS 463
C. Asensio, M. Ruiz, M. Recuero
A FOLDING ADC BASED ON SWITCHED CAPACITOR CIRCUITS IN 350-NM CMOS 468
W. Costa, S. Rodrigues, R. Freiere, S. Catunda, T. Silva, M. Castro, F. Sousa
EXHALED BREATH ALCOHOL - QUALITY ASSURANCE IN THE FIELD OF LEGAL METROLOGY 474
M. Anghel, F. Iacobescu, A. Salceanu

STUDY OF A HALL EFFECT BRAKE WEAR SENSOR USING FINITE ELEMENT MODELLING AND ANALYSIS 480
C. Anoop, G. Boby
IMPROVING HISTOGRAM TEST BY ASSURING UNIFORM PHASE DISTRIBUTION WITH SETTING BASED ON A FAST SINE FIT ALGORITHM 485
V. Palfi, I. Kollar
PHASE ERROR IN CURRENT TRANSFORMERS WITH NANOCRYSTALLINE ALLOYS CORE 491
T. Batsita, B. Luciano, R. Freire
DIGITAL SIGNAL PROCESSING IN PULSE METHOD FOR MEASURING FREQUENCY RESPONSE FUNCTION OF HIGH-CURRENT SHUNT 496
A. Zarevich, S. Muravyov, E. Bedareva
UPON THE INFLUENCE OF THE REAL VALUE OF HUMAN BODY CAPACITANCE IN ESD IMMUNITY TESTS 501
A. Salceanu, F. Iacobescu, M. Anghel
THERMOCOUPLE DYNAMIC ERRORS CORRECTION FOR INSTANTANEOUS TEMPERATURE MEASUREMENTS IN INDUCTION HEATING 508
K. Konopka
THE NATIONAL MEASUREMENT STANDARDS AT CEM AND THEIR ROLE IN MRA AND EMRP PROJECTS 515
M. Neira
LINEARIZATION OF A/D CONVERTERS USING INTERPOLATION OF SAMPLES 525
B. Renczes, I. Kollar
IEEE1588 V2 CLOCK DISTRIBUTION IN FLEXRIO DEVICES: CLOCK DRIFT MEASUREMENT 532
D. Sanz, M. Ruiz, J. Lopez, R. Castro, J. Vega, E. Barrera
DEVELOPMENT OF A SYSTEM FOR THE ACCURATE MEASUREMENT OF POWER WITH DISTORTED SIGNALS 538
U. Pogliano, B. Trinchera, D. Serazio
PSD ESTIMATION IN COGNITIVE RADIO SYSTEMS: A PERFORMANCE ANALYSIS 543
L. Angrisani, D. Capriglione, L. Ferrigno, G. Miele
EXPERIMENTAL SET-UP FOR THE VALIDATION OF NUMERICAL METHODS IN ELECTROMAGNETIC DOSIMETRY 549
D. Giordano, L. Zilberti, M. Borsero
METHOD FOR FORMING A MAGNETIC FIELD OF ARBITRARY SHAPE FROM AN ESTABLISHED TEMPLATE 555
J. Torrents, P. Juan-Garcia, M. Sanchez-Moragues
USER-FRIENDLY MATLAB TOOL FOR EASY ADC TESTING 561
T. Virosztek, I. Kollar
CHARACTERISED MEASURING SYSTEM FOR PQ MEASUREMENTS ON THE MV GRID 569
G. Crotti, D. Giordano
FROM SYSTEM DESIGN TO CLOCK SKEW IMPACT STUDY IN PARALLEL SIGMA DELTA MODULATORS USING FREQUENCY BAND DECOMPOSITION 575
R. Lahouli, M. Ben-Romdhane, C. Rebai, D. Dallet
MONITORING CELL MONOLAYERS DURING ELECTROPORATION: ELECTRICAL IMPEDANCE SPECTROSCOPY MEASUREMENTS 581
T. Garcia-Sanchez, M. Guitart, B. Sanchez, J. Rosell-Ferrer, A. Gomez-Foix, R. Brgoas
VOLTAGE SOURCE INVERTERS: AN EASY APPROACH FOR FAST FAULT DETECTION 587
A. Tommaso, F. Genduso, R. Miceli, C. Spataro
NFC RF ANALOG CHALLENGE AND ENHANCED HIGH SPEED TRANSMITTER DESIGN 593
L. Mwalula, M. Al-Janabi, I. Kale, T. Hammersley
NOVEL TIME-INTERLEAVED VARIABLE CENTRE-FREQUENCY, SINGLE-BIT A/D AND D/A SIGMA-DELTA MODULATOR TOPOLOGIES 599
I. Kizilkaya, M. Al-Janabi, I. Kale
THE MATLAB TOOLBOX FOR SIMULATION ANALYSIS AND DESIGN SUPPORT OF NEW ADAPTIVE SUB-RANGING A/D CONVERTERS 605
K. Jedrzejewski
A ROBUST AND NON-INVASIVE HEART-RATE MONITORING SYSTEM 611
S. Krishnamoorthy, C. Anoop, G. Boby
ON COMPRESSED SENSING AND SUPER-RESOLUTION IN DFT-BASED SPECTRAL ANALYSIS 615
M. Bertocco, G. Frigo, C. Narduzzi

MODELING AND SIMULATION OF A WHEATSTONE BRIDGE PRESSURE SENSOR IN HIGH TEMPERATURE WITH VHDL-AMS 621
S. Baccar, T. Levi, D. Dallet, F. Barbara
EXPERIMENTAL RESULTS ON MAGNETIC CORES FOR MAGNETIC INDUCTION-BASED ENERGY HARVESTING 625
T. Moraes, Y. Rodriguez, E. Melo, C. Souza
A METHODOLOGY TO ASSESS IMMUNITY TO RADIATED DISTURBANCES OF FPAA-BASED FRONT-END DEVICES FOR ELECTROCARDIOGRAPH SIGNAL MONITORING 631
D. Salhi, N. Pasquino
A FREQUENCY INDEPENDENT METHOD FOR ADAPTIVE CORRECTION OF TIME INTERLEAVED ANALOG TO DIGITAL CONVERTERS 637
A. Bonnetat, J. Hode, D. Dallet, G. Ferre
A REAL-TIME COMPENSATION METHOD FOR MV VOLTAGE TRANSDUCER FOR POWER QUALITY ANALYSIS 643
G. Crotti, D. Gallo, D. Giordano, C. Landi, M. Luiso
A SMART MEASUREMENT NETWORK FOR OPTIMIZATION OF ELECTRICAL GRID OPERATION 649
D. Cara, M. Luiso, G. Miele, P. Sommella
MEASUREMENT OF LANDSLIDE DISPLACEMENT AND ORIENTATION USING STRAIN GAUGES BASED ON AMORPHOUS MAGNETIC MICROWIRES 655
D. Petrisor, C. Fosalau, C. Zet, C. Damian
DATA ACQUISITION FOR GREEN ROOF 661
G. Pizzuti, F. Lamonaca, N. Arcuri
TESTING OF HIGH CURRENT TRANSFORMER BY NON-UNIFORM EQUIVALENT MAGNETOMOTIVE FORCE METHOD 666
K. Qu, W. Zhao, B. Jiang, S. Huang, Z. Huang
DOUBLE SQUIRREL CAGE INDUCTION MOTORS: A NEW APPROACH TO DETECT ROTOR BAR FAILURES 671
A. Tomaaso, F. Tilippetti, Y. Gritli, R. Miceli, C. Spataro
AN FPGA-BASED SYSTEM FOR REAL-TIME MONITORING OF VOLTAGE HARMONICS 677
B. Eristi, O. Yildirim, H. Eristi, Y. Demir
PRECISION TIMING IN TDMA-BASED WIRELESS SENSOR NETWORK THROUGH IEEE 1588 STANDARD 683
D. Toma, J. Rio, A. Manuel, S. Gomariz
DESIGN AND IMPLEMENTATION OF A HYBRID MPPT TECHNIQUE BASED ON THE SCAN OF THE POWER VS VOLTAGE INPUT CHARACTERISTIC OF THE INVERTER 687
M. Balato, D. Gallo, C. Landi, M. Luiso, M. Vitelli
PARAMETER EXTRACTION IN MULTI STEP EXPONENTIAL SIGNAL 694
D. Carni, D. Grimaldi, L. Michaeli, J. Saliga
ANALYSIS OF NETCDF-4 AND HDF-5 SCIENTIFIC FILE FORMATS FOR THE DATA ARCHIVING OF AN ITER FAST PLANT SYSTEM CONTROLLER PROTOTYPE 699
R. Castro, J. Vega, M. Ruiz, D. Sanz, E. Barrera
ON THE SUITABILITY OF COMPRESSIVE SAMPLING FOR THE IMPLEMENTATION OF LOW-COST MULTI-CHANNELS SYNCHRONOUS DATA ACQUISITION SYSTEM 705
L. Angrisani, F. Bonavolonta, L. Ferrigno, M. Laracca, A. Liccardo, G. Miele, R. Moriello
MEASUREMENT OF AMPLITUDE RATIO AND PHASE SHIFT BETWEEN SINUSOIDAL VOLTAGES WITH SUPERIMPOSED GAUSSIAN NOISE 711
P. Rochininski, M. Kampik
NON-INVASIVE SYSTEM OF DEEP AND FOCUSED TRANSCRANIAL MAGNETIC STIMULATION 716
V. Martins, F. Tejo, R. Freire, R. Silva, A. Neto, T. Silva, M. Marcolin, E. Fonoff
MODELING SINE-WAVE IMAGE COMPONENT CONTRIBUTION TO DISCRETE SPECTRUM 722
D. Belega, D. Dallet, D. Petri
THE IMPROVEMENT OF COMPENSATING CURRENT GENERATION ALGORITHMS IN ACTIVE POWER FILTERING 727
J. Mindykowski, X. Xu, T. Tarasiuk, C. Yang
A SMART CURRENT CONTROL FOR SUPERCONDUCTING CABLE TEST 733
P. Arpaia, A. Ballarino, V. Daponte, D. Maisto, G. Montenero, C. Svelto
PH SENSOR CALIBRATION PROCEDURE 739
C. Artero-Delgado, M. Nogueras-Cervera, A. Manuel Lazaro

MULTIPOLE-FIELD CORRECTION OF STRETCHED-WIRE MEASUREMENTS OF THE GRADIENT IN ACCELERATOR MAGNETS 744
P. Arpaia, C. Petrone, S. Russenschuck, L. Walckiers
DEFINING FREQUENCY DOMAIN PERFORMANCE OF ANALOG-TO-INFORMATION CONVERTERS 748
D. Bao, P. Daponte, L. Vito, S. Rapuano
THE EVOLUTION OF ELECTRICAL ENERGY MEASUREMENT IN BRAZIL 754
A. Franco, R. Debatin
PROGRAMMABLE POWER SPECTRAL DENSITY NOISE SOURCE 759
L. Angrisani, M. D'Arco, E. Napoli
GOOD PRACTICE GUIDE FOR CALIBRATING A HYDROPHONE "IN SITU" 765
A. Garcia-Benadi, J. Cadena-Munoz, J. Fernandez, A. Manuel-Lazaro
Author Index