

# **IMEKO TC7 Symposium on New Developments in the Field of Measurement Science 2002**

**Krakow, Poland  
25 – 27 June 2002**

**ISBN: 978-1-5108-0394-7**

**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© (2002) by the International Measurement Confederation (IMEKO)  
All rights reserved.

Printed by Curran Associates, Inc. (2015)

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

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

Phone/Fax: +36 1 353 1562

[imeko@t-online.hu](mailto: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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

<b>EPISTEMOLOGICAL FOUNDATIONS OF MEASUREMENT .....</b>	<b>12</b>
<i>L. Mari</i>	
<b>FUZZY NOMINAL SCALES.....</b>	<b>21</b>
<i>E. Benoit, L. Foulloy</i>	
<b>JURY-TEST METHODS FOR THE MEASUREMENT OF PERCEIVED QUANTITIES .....</b>	<b>26</b>
<i>M. Codda, F. Crenna, G. Rossi</i>	
<b>NEW KNOWLEDGE-BASED MEASUREMENTS IN PRECISION ENGINEERING.....</b>	<b>32</b>
<i>D. Ernst, H. Hage, D. Hofmann, G. Linss</i>	
<b>SYNTHESIS OF THE MEASURING SCALE FOR SHAPE OF ELECTRICAL SIGNALS.....</b>	<b>36</b>
<i>T. Piwowarczyk</i>	
<b>A NEW APPROACH TO GENERATION OF MEASUREMENT METHODS .....</b>	<b>44</b>
<i>B. Troianov, E. Donchev</i>	
<b>ON THE FIELD NATURE OF MEASURING PROCESS.....</b>	<b>50</b>
<i>M. Urbanski, J. Samsonowicz</i>	
<b>MODIFIED CONCEPT OF INDISCERNIBILITY AND A FORMAL BASIS OF CLASSIFICATION .....</b>	<b>56</b>
<i>H. Watanabe</i>	
<b>APPLICATION OF INFORMATION THEORY IN MEASUREMENT - A SURVEY .....</b>	<b>62</b>
<i>E. Woschni</i>	
<b>UNCERTAINTY'S ANALYSIS OF IMPEDANCE MEASUREMENTS IN THE SAMPLING SENSOR INSTRUMENT .....</b>	<b>66</b>
<i>J. Augustyn</i>	
<b>A STUDY ON UNCERTAINTY OF MEASUREMENT IN THE BLOOD CHEMICAL ANALYSIS .....</b>	<b>70</b>
<i>Y. Iwaki, T. Inamura, K. Kariya</i>	
<b>COHERENCE COEFFICIENTS AS UNCERTAINTY PARAMETERS OF ERROR VALUE SET.....</b>	<b>76</b>
<i>J. Jakubiec, K. Konopka</i>	
<b>UNCERTAINTY EVALUATION PROBLEMS IN MEASUREMENTS OF VOLUME AND SURFACE RESISTIVITIES .....</b>	<b>82</b>
<i>M. Lisowski, R. Kacprzyk</i>	
<b>DETERMINATION OF UNCERTAINTY OF THICKNESS MEASUREMENT OF THIN LAYERS IN MANIFACIER'S METHOD .....</b>	<b>88</b>
<i>J. Makal</i>	
<b>USING THE EFFECTIVE NUMBER OF BITS TO EVALUATE THE MEASUREMENT UNCERTAINTY .....</b>	<b>92</b>
<i>S. Nuccio, C. Spataro</i>	
<b>THE RANGE OF APPLYING APPROXIMATE METHODS OF EXPANDED UNCERTAINTY ESTIMATION IN INDIRECT MEASUREMENTS .....</b>	<b>97</b>
<i>P. Otomanski</i>	
<b>FUZZY APPROACH FOR THE THEORY OF MEASUREMENT INEXACTNESS .....</b>	<b>102</b>
<i>M. Urabanski</i>	
<b>UNCERTAINTY EVALUATION: ANALYSIS OF SIMULTANEOUS MEASUREMENT OF MULTIPLE MEASURANDS.....</b>	<b>108</b>
<i>A. Zanobini, G. Iuculano, G. Pellegrini</i>	
<b>WEAKLY DEFINED MEASUREMENTS .....</b>	<b>113</b>
<i>L. Finkelstein</i>	
<b>THE OPTIMAL CORRECTION OF KNOWN MEASUREMENT WINDOWS .....</b>	<b>119</b>
<i>M. Bockowska</i>	
<b>ABOUT FAULT DIAGNOSIS OF MULTIPOINT ANALOG ELECTRONIC CIRCUITS BASED ON TRANSFORMATIONS IN MULTIDIMENSIONAL SPACES.....</b>	<b>125</b>
<i>Z. Czaja, R. Zielonko</i>	
<b>SERVING OBJECT INFORMATION STATE ESTIMATION .....</b>	<b>131</b>
<i>T. Dominyuk, O. Ivakhiv, A. Kowalczyk, P. Mushenyk, B. Stadnyk, D. Sc</i>	
<b>A NEW EXPERIMENTAL METHOD FOR CORRECTING DISPERSION IN PRESSURE BAR MEASUREMENTS OF IMPULSIVE FORCE AND PRESSURE .....</b>	<b>135</b>
<i>A. Drobnica, Z. Kaczmarek</i>	
<b>THE METHOD OF CREATING OF PROCEDURES FOR NUMERICAL DIFFERENTIATION OF SIGNALS .....</b>	<b>141</b>
<i>A. Zuchowski, B. Grzywacz</i>	

<b>SHAPES OF INPUT SIGNALS FOR CALIBRATION OF MEASURING SYSTEMS INTENDED FOR DYNAMIC SIGNALS MEASUREMENT .....</b>	<b>146</b>
<i>E. Layer</i>	
<b>SYNTHESIS OF OPTIMISED DIGITAL FILTERS USED TO SIGNAL CORRECTION IN MEASUREMENT SYSTEMS .....</b>	<b>150</b>
<i>M. Siwczynski, M. Koziol</i>	
<b>TRANSFER FUNCTION IDENTIFICATION BASED ON THE SAMPLED INITIAL STAGE OF THE PROCESS STEP RESPONSE.....</b>	<b>157</b>
<i>S. Skoczowski</i>	
<b>EDDY CURRENT FLAW DETECTION WITH NEURAL NETWORK APPLICATIONS .....</b>	<b>161</b>
<i>M. Wrzuszczak, J. Wrzuszczak</i>	
<b>MEASUREMENT, KNOWLEDGE AND ADVANCEMENT .....</b>	<b>166</b>
<i>P. Sydenham</i>	
<b>INVESTIGATION OF THE REFERENCE MODEL USED FOR VERIFICATION OF THE CONDUCTANCE TOMOGRAPHY SYSTEM.....</b>	<b>178</b>
<i>M. Dorozhovets, A. Kowalczyk, B. Stadnyk</i>	
<b>LINEAR PREDICTION CODING IN VERIFICATION OF THE QUALITY OF STEEL ANCHOR ADHESION IN ROCK MASS.....</b>	<b>182</b>
<i>K. Gadek</i>	
<b>MEASUREMENTS OF TEXTURE FEATURES OF MEDICAL IMAGES AND ITS APPLICATION TO COMPUTER-AIDED DIAGNOSIS IN CARDIOMYOPATHY .....</b>	<b>186</b>
<i>D. Tsai, K. Kojima</i>	
<b>CONDUCTIVITY MEASUREMENTS OF CONDUCTING MATERIALS WITH THE USE OF INDUCTIVE TRANSDUCER IN DIGITAL MEASUREMENT SYSTEM.....</b>	<b>192</b>
<i>J. Kusmierz</i>	
<b>SCHEDULING THEORY IN NETWORKED MEASUREMENT - CONTROL SYSTEMS DESIGN .....</b>	<b>197</b>
<i>E. Michta</i>	
<b>PETRII NET AS A TOOL FOR MODELLING THE MICROPROCESSOR MEASUREMENT-CONTROL SYSTEM USED IN CRITICAL APPLICATIONS .....</b>	<b>203</b>
<i>R. Mielnik</i>	
<b>A PRECISE AMPLIFIER FOR DIGITALLY SYNTHESIZED SOURCE .....</b>	<b>207</b>
<i>M. Kampik</i>	
<b>EFFECTIVE ANALYSIS AND ELABORATION COMPETITIVE METHODS FOR GENERATING LPL FOR A/D CONVERSION .....</b>	<b>212</b>
<i>L. Petryshyn, G. Pedrak</i>	
<b>A NOVEL SEMICONDUCTOR SILICON SMART SENSOR FOR THE CHARACTERISATION OF ELECTRO-MEDICAL LITHOTRIPTERS .....</b>	<b>220</b>
<i>V. Singh</i>	
<b>DEVELOPMENT OF A DESIGN METHODOLOGY FOR DIGITAL MEASUREMENT INSTRUMENTATION USING COMPLEX PROGRAMMABLE LOGIC DEVICES .....</b>	<b>225</b>
<i>J. Valeriano, F. Lara, N. Chavez</i>	
<b>BRIDGES SUPPLIED BY TWO CURRENT SOURCES - NEW TOOL FOR IMPEDANCE MEASUREMENTS AND SIGNAL CONDITIONING.....</b>	<b>231</b>
<i>Z. Warsza</i>	
<b>PROBABILISTIC UNCERTAINTY EVALUATION AIDING CRITICAL MEASUREMENT-BASED DECISION .....</b>	<b>237</b>
<i>G. Rossi, F. Crenna</i>	
<b>Author Index</b>	