2013 IEEE International Ultrasonics Symposium

(IUS 2013)

Prague, Czech Republic
21 - 25 July 2013

Pages 1-732

IEEE Catalog Number: CFP13ULT-POD
ISBN: 978-1-4673-5685-5

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Tomographic Array Design for Online, Non-invasive, Non-intrusive Measurement of Magnox Slurry during Nuclear Decommissioning 1865
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Ultrasonic Measurement of Micrometric Wallthickness Loss Due to Corrosion Inside Pipes 1881
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Temperature Uniformity of Microdroplet Heated by Rayleigh Surface Acoustic Wave in View of Biological Reaction 1885
T. Roux-Marchand, D. Beyssen, F. Sarry, O. Elmazria

Impact of Transducers Configuration in a Pilot Sonoreactor Used for Nanocellulose Production by Ultrasound-assisted TEMPO Oxidation 1889
Eric Loranger, André-Olivier Piché, Claude Daneault

Ultrasonic Studies of Polymer Composites with Inorganic Nanotubes 1893
V. Samulionis, J. Banys, Š. Svirskas, A. Sanchez-Ferrer, R. Mezzenga

Viscoelastic Monitoring of Curing Geopolymer by Ultrasonic Rheology 1895
Julien Rouyer, Arnaud Poulesquen, Fabien Frizon
Statistical Signal Processing for Ultrasonic Particle Characterization 1899
Sebastian Wockel, Ulrike Steinmann, Robert Weser, Benno Wessely
Manipulation of Microspheres and Microbubbles in an Octagonal Sonotweezers 1903
A. L. Bernassau, C. R. P Courtney, J. Beeley, B. W. Drinkwater, D. R. S Cumming
Two-dimensional Manipulation of Microbubbles Using Primary Bjerknes Force 1907
Kazuhito Inoue, Hironobu Kaji, Hiroyuki Ushijima, Takashi Azuma, Shu Takagi, Yoichiro Matsumoto, Kiyoshi Yoshinaka, Mitsuhisa Ichiyanagi
Thick Film PZT Transducer Arrays for Particle Manipulation 1911
Yongqiang Qiu, Han Wang, Aleksandrs Bolhovitins, Christine Demore, Sandy Cochran, Sylvia Gebhardt, Andreas Schonecker
A Study of Nanoparticle Manipulation Using Ultrasonic Standing Waves 1915
P. L. M. J. Van Neer, A. Rasidovic, A. W. F. Volker
Acoustic Radiation Force on Cylindrical Particles Near Subwavelength Slits 1919
Chen Wang, Yan Kang, Feiyan Cai, Fei Li, Long Meng, Hairong Zheng
Ultra-high Q.f product laterally-coupled AlN/Silicon and AlN/Sapphire High Overtone Bulk Acoustic Wave Resonators 1922
A. Reinhardt, M. T. Delaye, J. Abergel, V. Kovacova, M. Allain, L. Andreutti, D. Mercier, J. Georges, F. Tomaso, P. P. Lassagne, E. Defay, N. Chretien, T. Baron, G. Martin, E. Lebrasseur, S. Ballandras, L. Chommeloux, J. M. Lesage
Modeling of Inter-digitated Transducer for Highorder Contour Mode Resonators 1926
Renyuan Wang, Sunil A. Bhave, Kushal Bhattacharjee
Oscillator-based Strain Gauges Employing Surface Acoustic Wave Resonators for Wireless Sensor Network 1930
Tomokatsu Konno, Motoaki Hara, Hiroki Kuwano
Chip-Scale Sonic Communication Using AlN Transducers 1934
Jason Hoople, Justin Kuo, Serhan Ardanuç, Amit Lal
Infra-red Thermography for Spatially Resolved Measurements of the Temperature Distribution on the Acoustic Wave Devices 1938
T. Roux-Marchand, O. Elmazria, F. Sarry
SAW Strain Sensors – High Precision Strain Sensitivity Investigation on Chip-Level 1942
Jochen Hempel, Dominik Finke, Matthias Steiert, Roderich Zeiser, Michael Berndt, Jürgen Wilde, Leonhard Reindl
Investigation of Delay Path Modifications of Surface Acoustic Wave Sensors 1946
M. Richardson, S. Koochakzadeh, V. R. Bhethanabotla, K. Suthar, S. K. R. S. Sankaranarayanan
Experimental Investigation of a Novel SAW Strain Sensor with Inbuilt Temperature Measurement Capability 1949
Alice Fischerauer, Christian Schwarzmüller, Gerhard Fischerauer
Analysis of Rayleigh Wave Radiations from Leaky SAW Resonators 1953
Shogo Inoue, Kentaro Nakamura, Hidetaro Nakazawa, Jun Tsutsumi, Masanori Ueda, Yoshio Satoh
Impact of Surface Periodic Grating on FBAR Structures to Spurious Transverse Resonances 1957
Jiansong Liu, Tatsuya Omori, Changjun Ahn, Ken-Ya Hashimoto
Analysis of Heat Dissipation Improvement using Bonded Wafer in Chip Size SAW Device Structure 1961
T. Suzuki, T. Nishizawa, O. Kawachi
Rigorous COM and P-matrix Approaches to the Simulation of Third-order Intermodulation Distortion and Triple Beat in SAW _lters 1965
Markus Mayer, Werner Ruile, John Johnson, Ingo Bleyl, Karl Wagner, Andreas Mayer, Elena Mayer
Evaluation of the Pyroelectric Response of Embedded Piezoelectrics by Means of a Nyquist Plot 1969
G. Suchaneck, A. Eydam, G. Gerlach, M. Gude, T. Weber, A. Winkler
2D Array Transducer with a Conductive Backing 1973
Jeongdong Woo, Wonseok Lee, Sanggon Lee, Yongrae Roh, Hyungkeun Lee, Byungkuk Bae, Eunhee Shin, Sunghag Kim
Design and Fabrication of a New Multi-Active-layer Transducer with a Single-Copper-Layer FPCB 1975
Eunhee Shin, Sangseok Lee, Jongkil Kim, Byungkuk Bae, Heewon Kim, Susung Lee, Yongrae Roh
Phased Transducer Array for Acoustic Energy Harvesting Inside an MRI Machine 1979
V. Klymko, M. Roes, J. Van Duivenbode, E. Lomonova
Wide Aperture Convex Array Transducer with PMNPT Piezoelectric Single Crystals 1983
Heewon Kim, Jongkil Kim, Susung Lee, Sangwoong Lee, Boyeon Cho, Wonho Noh, Nelson H. Oliver
Design, Modeling and Characterization of a 35MHz 1-D CMUT Phased Array 1987
Toby Xu, Coskun Tekes, Sarp Satir, Evren Arkan, Maysam Ghovanloo, F. Levent Degertekin

Multi-Frequency CMUT Arrays for Imaging-Therapy Applications 1991
Abhijeet Kshirsagar, Ryan Chee, Alexander Sampaleanu, Alexander Forbrich, Deepak Rishi, Walied Moussa, Roger J. Zemp

Synthetic Aperture 3D Ultrasound Imaging Schemes witih S-Sequence Bias-Encoded Top-Orthogonal-to- Bottom-Electrode 2D CMUT Arrays. 1994
Alexander Sampaleanu, Roger Zemp

Harmonic Generation with a Dual Frequency Pulse 1998
Christina P. Keravnou, Michalakis A. Averkiou

Real-time Base-band Pulse Compression Imaging 2002
A. Ramalli, F. Guidi, E. Boni, P. Tortoli

Phase Aberration Effects on Beam Shape Evaluated with Particle Motion in an Elastic Phantom 2006
Sara Aristizabal, Carolina Amador, James F. Greenleaf, Matthew W. Urban

Tissue Imaging Using the Transmission of 100-MHz-range Ultrasound Through a Fused Quartz Fiber 2010
Takasuke Irie, Tomohito Hasegawa, Kouichi Itoh, Norio Hirota, Norio Tagawa, Masasumi Yoshizawa, Tadashi Moriya, Takashi IIjima

Visualization of Cancer Distribution for Living Tissues Using Acoustic Impedance Microscope 2014
S. Yoshida, H. Yamada, Y. Shioki, N. Hozumi, M. Yagihashi, K. Kobayashi, S. Yamamoto

Towards High Frame Rate Cardiac Ultrasonography - a Circular Wave Imaging Approach 2018
Daniel Posada, Sarah Dort, Boris Chayer, Shahrokh Shahriari, Guy Cloutier, Hervé Liebgott, Damien Garcia

Non-invasive Measurement of Pressure Gradients in Pulsatile Flow using Ultrasound 2022
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A Particle-Based Simulation Tool for Ultrasound Blood Flow Imaging: Validation of High-Speed Echo-PIV 2034
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A Novel High-frequency Endoscopic Ultrasound System for Colorectal Cancer Diagnosis 2045
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Contrast-Enhanced Ultrasound Imaging for the Detection of Transient Dynamics of Blood-Brain Barrier Opening Induced by Focused Ultrasound 2088
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High-Sensitivity Distribution Mapping of Iron, Zinc and Copper during SPIO-Microbubbles Facilitated Focused Ultrasound Induced Blood-Brain Barrier Opening via Laser Ablation/Inductively Coupled Plasma Mass Spectrometry 2092
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