

PRELIMINARY PROGRAM (Ver. 4)

**The 26th IEEE International Conference on Micro Electro Mechanical Systems
IEEE MEMS 2013
January 20 – 24, 2013
Taipei International Convention Center**

Monday, January 21, 2013

**Welcome Address
8:30-9:00**

**Invited Talk 1
9:00-9:40
Prof. James Liao
UCLA, USA**

**1 BIO-MEMS
9:40-10:40**

**1-1 (1714)
CONTROLLED DELIVERY OF ANTIANGIOGENIC DRUG TO HUMAN EYE TISSUE USING A
MEMS DEVICE**

Fatemeh Nazly Pirmoradi¹, Kevin Ou², John K. Jackson², Kevin Letchford², Jing Cui², Tom Zhao²,
Joanne A. Matsubara², Helen Burt², Mu Chiao²
Liwei Lin¹

¹University of California, Berkeley, USA, ²University of British Columbia, Canada

**1-2 (1166)
QUANTITATIVE EVALUATION OF THE INFLUENCE OF DOPAMINERGIC NEURON ON
FLAPPING LOCOMOTION**

Koki Azuma, Hidetoshi Takahashi, Tetsuo Kan, Jun Tanimura, Kei Ito, Kiyoshi Matsumoto, Isao
Shimoyama
The University of Tokyo, Japan

**1-3 (1627)
MEMS STRUCTURE WITH TUNABLE STIFFNESS USING THE MAGNETORHEOLOGICAL
EFFECT**

Guang-Yue Liu, Weileun Fang
National Tsing Hua University, Taiwan

**Break & Exhibition Inspection
10:40-11:10**

**2 Bio Inspired MEMS
11:10-12:30**

**2-1 (1821)
A SELF-SWIMMING MICROBIAL-ROBOT USING MICROFABRICATED BIOPOLYMER**

Kazuhiko Higashi¹, Tomonori Kano¹, Norihisa Miki²
¹Keio University, Japan, ²Keio University, JST PRESTO, Japan

**2-2 (1489)
MUSCLE BASED BIOACTUATOR DRIVEN IN AIR**

Yuya Morimoto¹, Hiroaki Onoe², Shoji Takeuchi²

¹The University of Tokyo, Japan, ²The University of Tokyo, ERATO Takeuchi Biohybrid Project, Japan

2-3 (1704)

EFFECTIVENESS OF BRISTLED WING OF THRIPS

Ken Sato, Hidetoshi Takahashi, Minh-Dung Nguyen, Kiyoshi Matsumoto, Isao Shimoyama
The University of Tokyo, Japan

2-4 (1481)

ELECTROSPUN NANOFIBRILS ENCAPSULATED IN HYDROGEL CUPULA FOR BIOMIMETIC MEMS FLOW SENSOR DEVELOPMENT

Ajay Giri Prakash Kottapalli¹, Mohsen Asadnia¹, Jianmin Miao¹, Michael Triantafyllou²
¹Nanyang Technological University, Singapore, ²Massachusetts Institute of Technology, USA

Lunch & Exhibition Inspection

12:30-13:30

Poster/Oral Session 1

13:30-15:30

Break & Exhibition Inspection

15:30-16:00

3A Mechanical Sensor

16:00-18:00

3A-1 (1593)

SILICON ACCELEROMETER WITH DIFFERENTIAL FREQUENCY MODULATION AND CONTINUOUS SELF-CALIBRATION

Alexander A. Trusov, Sergei A. Zotov, Brenton R. Simon, Andrei M. Shkel
University of California, Irvine, USA

3A-2 (1368)

WAFER-LEVEL VACUUM PACKAGED TRI-AXIAL ACCELEROMETER WITH NANO AIRGAPS

Yaesuk Jeong¹, Diego E. Serrano¹, Varun Keesara², Wang-kyung Sung¹, Farrokh Ayazi¹
¹Georgia Institute of Technology, USA, ²Qualtre' Inc., USA

3A-3 (1801)

DEVELOPMENT OF FLEXIBLE TACTILE SENSOR BASED ON CONTACT RESISTANCE OF INTEGRATED CARBON NANOTUBES

Jae-Ik Lee¹, Soonjae Pyo¹, Min-Ook Kim¹, Taeyoung Chung¹, Hyung-Kew Lee², Soo-Chul Lim², Joonah Park², Jongbaeg Kim¹
¹Yonsei University, Korea, ²Samsung Advanced Institute of Technology, Korea

3A-4 (1013)

HIGH SENSITIVE 3D TACTILE SENSOR WITH THE STRUCTURE OF ELASTIC PYRAMIDS ON PIEZORESISTIVE CANTILEVERS

Nguyen Thanh-Vinh, Nguyen Binh-Khiem, Kiyoshi Matsumoto, Isao Shimoyama
The University of Tokyo, Japan

3A-5 (1120)

RESONANT PRESSURE SENSOR WITH ON-CHIP TEMPERATURE AND STRAIN SENSORS FOR ERROR CORRECTION

Chia-Fang Chiang¹, Andrew B. Graham², Brian Lee¹, Chae Hyuck Ahn¹, Eldwin J. Ng¹, Gary J. O'Brien², Thomas W. Kenny¹
¹Stanford University, USA, ²Robert Bosch RTC, USA

3A-6 (1435)

ON-CHIP INTEGRATED PS3 (PACKAGING-STRESS SUPPRESSED SUSPENSION) FOR THERMAL-STRESS FREE PACKAGE OF PRESSURE SENSORS

Jiachou Wang, Lijian Yang, Xinxin Li

Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China

3B1 Bio Sensors

16:00-17:00

3B1-1 (1235)

A HANDHELD, CELL PHONE-BASED ELECTROCHEMICAL BIODETECTOR

Peter B. Lillehoj¹, Ming-Chun J. Huang², Chih-Ming Ho²

¹Michigan State University, USA, ²University of California, Los Angeles, USA

3B1-2 (1698)

INTRA/EXTRACELLULAR INVESTIGATION FOR ION CHANNELS WITH LIPID BILAYER ARRAY AT SINGLE MOLECULAR LEVEL

Ryuji Kawano¹, Yutaro Tsuji¹, Toshihisa Osaki¹, Koki Kamiya¹, Norihisa Miki³, Minako Hirano⁴, Toru Ide⁴, Shoji Takeuchi²

¹Kanagawa Academy of Science and Technology (KAST), Japan, ²University of Tokyo, Japan, ³Keio University, Japan, ⁴The Graduate School for the Creation of New Photonics Industries, Japan

3B1-3 (1054)

MICRO FORCE PLATE ARRAY FOR MEASUREMENT OF GROUND REACTION FORCE OF INSECT RUNNING

Hidetoshi Takahashi, Kiyoshi Matsumoto, Isao Shimoyama

The University of Tokyo, Japan

3B2 Bio-Mimetic Actuators

17:00-18:00

3B2-1 (1728)

MICRO PROPULSION IN LIQUID BY OSCILLATING BUBBLES

Jian Feng, Sung Kwon Cho

University of Pittsburgh, USA

3B2-2 (1719)

PARTICLE TRANSPORTOR USING CILIA OF VORTICELLA

Moeto Nagai, Yo Hayasaka, Takahiro Kawashima, Takayuki Shibata

Toyohashi University of Technology, Japan

3B2-3 (1066)

SELF-ASSEMBLY OF CELL SPRINGS USING SMOOTH MUSCLE-LIKE CELLS DIFFERENTIATED FROM MULTIPOTENT CELLS

Amy Y. Hsiao¹, Teru Okitsu¹, Hiroaki Onoe¹, Mahiro Kiyosawa¹, Hiroki Teramae², Shintaroh Iwanaga¹, Shigenori Miura¹, Tomohiko Kazama³, Taro Matsumoto³

Shoji Takeuchi¹

¹The University of Tokyo, Japan, ²Shumei University, Japan, ³Nihon University, Japan

Tuesday, January 22, 2013

Invited Talk 2

8:30-9:10

Prof. Shangjr (Felix) Gwo

National Tsing-Hua University, Taiwan

4 Fabrication

9:10-10:10

Break & Exhibition Inspection

10:10-10:40

4-1 (1454)

IN-LIQUID MEMS ASSEMBLY BY OPTICAL TRAPPING

Maurizio R. Gullo, Loic Jacot-Descombes, Juergen Brugger
Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland

4-2 (1188)

THE GROWTH OF 3D VA-CNTS STACKS BY PREDEFINING MULTILAYERED AL/FE CATALYST FILMS FOR MEMS FABRICATION

C.-F. Hu, C.-L. Cheng, W. Fang
National Tsing Hua University, Taiwan

4-3 (1562)

ELECTROSTATIC BOTTOM-DRIVEN ROTARY STAGE ON MULTIPLE CONDUCTIVE LIQUID-RING BEARINGS

Tingyi Liu, Guangyi Sun, Jong Jin Kim, Chih-Kong K. Yang, Chang-Jin Kim
University of California, Los Angeles, USA

5 Cell & Diagnosis

10:40-11:40

5-1 (1183)

CELLS ON ARRAYS OF MICROSPRINGS: AN APPROACH TO ACHIEVE TRI-AXIAL CONTROL OF SUBSTRATE STIFFNESS

Ryan D. Sochol¹, Yun Jung Heo¹, Shintaroh Iwanaga¹, Jonathan Lei², Ki Tae Wolf², Albert Lu²,
Makoto Kurihara¹, Song Li², Liwei Lin²
Shoji Takeuchi¹

¹The University of Tokyo, Japan, ²University of California, Berkeley, USA

5-2 (1191)

A NEW PATHOGEN DETECTION SYSTEM BY UTILIZING NANOGOLD MODIFIED SPECIFIC PROBE AND VANCOMYCIN COATED MAGNETIC BEADS ON AN INTEGRATED MICROFLUIDIC DEVICE

Chih-Hung Wang¹, Chia-Jung Chang¹, Jiunn-Jong Wu², Gwo-Bin Lee¹

¹National Tsing Hua University, Taiwan, ²National Cheng Kung University, Taiwan

5-3 (1286)

ELECTROMAGNET-ACTUATED DROPLET PLATFORM FOR SAMPLE-TO-ANSWER GENETIC DETECTION

Chi-Han Chiou, Dong J Shin, Suneil Hosmane, Yi Zhang, Tza-Huei Wang
Johns Hopkins University, USA

MEMS2014 Annoucement

11:40-12:00

Lunch & Exhibition Inspection

12:00-13:00

Poster/Oral Session 2

13:00-15:00

Break & Exhibition Inspection
15:00-15:30

6A1 Power MEMS
15:30-16:30

6A1-1 (1639)
AN ELECTROSTATIC SPRINGLESS INERTIAL HARVESTER FOR CONVERTING MULTI-DIMENSIONAL LOW-FREQUENCY MOTION
Tzeno Galchev, Roiy Raz, Oliver Paul
University of Freiburg, Germany

6A1-2 (1071)
LARGE POWER AMPLIFICATION OF A PIEZOELECTRIC ENERGY HARVESTER EXCITED BY RANDOM VIBRATIONS
Ziyang Wang, Rene Elfrink, Ruud J. M. Vullers, Svetla Matova, Jos Oudenhoven, Rob van Schaijk
Holst Centre/IMEC, Netherlands

6A1-3 (1456)
ENERGY HARVESTERS WITH HIGH ELECTROMAGNETIC CONVERSION EFFICIENCY THROUGH MAGNET AND COIL ARRAYS
Qian Zhang, Eun Sok Kim
University of Southern California, USA

6A2 High-Q Resonators
16:30-17:30

6A2-1 (1430)
HIGH-Q CAPACITIVE-PIEZOELECTRIC ALN LAMB WAVE RESONATORS
Ting-Ta Yen, Albert P. Pisano, Clark T.-C. Nguyen
University of California, Berkeley, USA

6A2-2 (1697)
ENHANCEMENT OF MECHANICAL Q FOR LOW PHASE NOISE OPTOMECHANICAL OSCILLATORS
Tristan O. Rocheleau, Alejandro J. Grine, Karen E. Grutter, Robert Schneider, Niels Quack, Ming C. Wu, Clark T.-C. Nguyen
University of California, Berkeley, USA

6A2-3 (1288)
PIEZOELECTRICALLY TRANSDUCED HIGH-Q SILICA MICRO RESONATORS
Zhengzheng Wu, Adam Peczkalski, Vikram Thakar, Zongliang Cao, Yi Yuan, Guohong He, Rebecca Peterson, Khalil Najafi, Mina Rais-Zadeh
University of Michigan, USA

6B1 Bio-inspired Structures
15:30-16:30

6B1-1 (1546)
FLEXIBLE, ZERO POWERED, PIEZOELECTRIC MEMS PRESSURE SENSOR ARRAYS FOR FISH-LIKE PASSIVE UNDERWATER SENSING IN MARINE VEHICLES
Mohsen Asadnia¹, Ajay Giri Prakash Kottapalli¹, Zhiyuan Shen¹, Jianmin Miao¹, Michael Triantafyllou²
¹Nanyang Technological University, Singapore, Singapore, ²Massachusetts institute of technology, USA

6B1-2 (1759)

SPECIALLY PATTERNED AND ALIGNED NEURAL BUNDLE FORMED BY NEURAL STEM CELL MICROFIBERS

Midori Kato-Negishi, Hiroaki Onoe, Shoji Takeuchi
The University of Tokyo, Japan

6B1-3 (1351)

A THREE-DIMENSIONAL DEFORMABLE LIQUID LENS ARRAY FOR DIRECTIONAL AND WIDE ANGLE LAPAROSCOPIC IMAGING

Kang Wei, Yi Zhao
The Ohio State University, USA

6B2 Cell Tissue Analysis

16:30-17:30

6B2-1 (1220)

A MINIATURE FIBER-OPTIC RASTER SCANNER FOR 2D OPTICAL IMAGING OF BIOLOGICAL TISSUES

Hadi Mansoor¹, Haishan Zeng², Isabella T. Tai², Jianhua Zhao², Mu Chiao¹
¹University of British Columbia, Canada, ²British Columbia Cancer Agency Research Centre, Canada

6B2-2 (1642)

THE EFFECT OF SHEAR-INDUCED LIFT FORCE ON THE HIGH-SPEED CELL MOTION IN MICROCHANNEL WITH ADHESIVE WALL

Duangrudee Rangsiwatakamong, Kenichi Morimoto, Yuji Suzuki
The University of Tokyo, Japan

6B2-3 (1774)

VERTICAL AND HORIZONTAL CONFOCAL IMAGING OF SINGLE CELLS ON MAGNETICALLY HANDLEABLE MICROPLATES

Tetsuhiko Teshima¹, Hiroka Aonuma², Hiroaki Onoe¹, Hirotaka Kanuka², Shoji Takeuchi¹
¹Institute of Industrial Science, The University of Tokyo, Japan, ²Jikei University, Japan, ³ERATO Takeuchi Biohybrid Innovation Project, JST, Japan

Wednesday, January 23, 2013

Invited Talk 3

8:30-9:10

Prof. Albert van den Berg
University of Twente, The Netherlands

7 Microfluidics

9:10-10:10

7-1 (1184)

SINGLE-LAYER "DOMINO" DIODES VIA OPTOFLUIDIC LITHOGRAPHY FOR ULTRA-LOW REYNOLDS NUMBER APPLICATIONS

Ryan D. Sochol, Casey C. Glick, Kye Y. Lee, Thomas Brubaker, Albert Lu, Melissa Wah, Ki Tae Wolf, Shan Gao, Luke P. Lee
Liwei Lin
University of California, Berkeley, USA

7-2 (1601)

A COMPACT PASSIVE AIR FLOW REGULATOR FOR PORTABLE BREATH DIAGNOSTICS

Staffan Johansson, Göran Stemme, Niclas Roxhed
KTH Royal Institute of Technology, Sweden

7-3 (1664)

SPLIT-AND-CONTACT DEVICE TO FORM PLANAR LIPID BILAYERS

Yutaro Tsuji¹, Ryuji Kawano¹, Toshihisa Osaki¹, Koki Kamiya¹, Norihisa Miki³, Shoji Takeuchi¹
¹Kanagawa Academy of Science and Technology, Japan, ²Institute of Industrial Science, The University of Tokyo, Japan, ³Keio University, Japan

Break & Exhibition Inspection

10:10-10:40

8 Resonator

10:40-12:00

8-1 (1223)

HIGH $k_t^2 \times Q$, MULTI-FREQUENCY LITHIUM NIOBATE RESONATORS

Renyuan Wang, Sunil A. Bhave
Cornell University, USA

8-2 (1355)

EFFECT OF THICKNESS ANISOTROPY ON DEGENERATE MODES IN OXIDE MICRO-HEMISPHERICAL SHELL RESONATORS

Logan D. Sorenson, Peng Shao, Farrokh Ayazi
Georgia Institute of Technology, USA

8-3 (1028)

LARGE-DISPLACEMENT PARAMETRIC RESONANCE USING A SHAPED COMB DRIVE

Congzhong Guo, Erdinc Tatar, Gary K. Fedder
Carnegie Mellon University, USA

8-4 (1059)

HIGH-Q FUSED SILICA BIRDBATH AND HEMISPHERICAL 3-D RESONATORS MADE BY BLOW TORCH MOLDING

Jae Yoong Cho, Jialiang Yan, Jeffrey A. Gregory, Rebecca L. Peterson, Khalil Najafi
University of Michigan, USA

Lunch & Exhibition Inspection

12:00-13:00

Poster/Oral Session 3

13:00-15:00

Break & Exhibition Inspection

15:00-15:30

9A Physical MEMS & Others

15:30-17:30

9A-1 (1112)

MEMS SENSOR ARRAY PLATFORM INTEGRATED WITH CMOS BASED OPTICAL READOUT

Refik B. Erarslan¹, Sevil Z. Lulec¹, Ulas Adiyani¹, Selim Olcer¹, Yuksel Temiz², Yusuf Leblebici², Hamdi Torun³, Hakan Urey¹
¹Koc University, Turkey, ²Ecole Polytechnique Federale de Lausanne, Switzerland, ³Bogazici University, Turkey

9A-2 (1432)

SUB-10 NANOMETER UNCOOLED PLATINUM BOLOMETERS VIA PLASMA ENHANCED ATOMIC LAYER DEPOSITION

Fabian Purkl¹, Tim English², Gary Yama³, J Provine², Ashwin K. Samarao³, Ando Feyh³, Gary

O'Brien³, Oliver Ambacher⁴, Roger T. Howe²

Thomas W. Kenny²

¹University of Freiburg and Robert Bosch LLC, USA, ²Stanford University, USA, ³Robert Bosch LLC, USA, ⁴University of Freiburg, Germany

9A-3 (1760)

MICRO EINZEL LENS FOR WAFER-INTEGRATED ELECTRON BEAM ACTUATION

Yue Shi, Serhan Ardanuc, Amit Lal

Cornell University, USA

9A-4 (1439)

DEVELOPMENT OF MULTI-AXES CMOS-MEMS RESONANT MAGNETIC SENSOR USING LORENTZ AND ELECTROMAGNETIC FORCES

Chun-I Chang, Ming-Han Tsai, Yu-Chia Liu, Weileun Fang

National Tsing Hua University, Taiwan

9A-5 (1142)

LATERALLY-DRIVEN PIEZOELECTRIC BIMORPH MEMS ACTUATOR WITH SOL-GEL-BASED HIGH-ASPECT-RATIO PZT STRUCTURE

Nan Wang, Shinya Yoshida, Masafumi Kumano, Yusuke Kawai, Shuji Tanaka, Masayoshi Esashi

Tohoku University, Japan

9A-6 (1613)

DIRECT-WRITE N- AND P-TYPE GRAPHENE CHANNEL FETS

Jiyoung Chang¹, Yumeng Liu², Heo Kwang², Byung Yang Lee³, Seung-wuk Lee², Liwei Lin²

¹University of California at San Francisco, USA, ²University of California at Berkeley, USA, ³Korea University, Korea

9B1 Microjet

15:30-16:30

9B1-1 (1268)

PATTERNABLE ATMOSPHERIC-PRESSURE PLASMA JETS WITH GAS DISCHARGE IN MICROFLUIDIC CHANNEL ARRAY

Hidetaka Yamasaki, Kyohei Terao, Takaaki Suzuki, Fusao Shimokawa, Hidekuni Takao

Kagawa University, Japan

9B1-2 (1689)

SIMULTANEOUS ABLATION AND INJECTION BY ELECTRICALLY-INDUCED MONO-DISPERSED BUBBLE KNIFE FOR BIOMEDICAL APPLICATIONS

Hiroki Kuriki¹, Yoko Yamanishi¹, Shinya Sakuma¹, Satoshi Akagi², Fumihito Arai¹

¹Nagoya University, Japan, ²National Agriculture and Food Research Organization, Japan

9B1-3 (1398)

THIN FILMS CHARACTERIZATION USING NANOFLUIDIC CHIP

S. Xiong¹, T. Tandiono², K. Ando¹, C. D. Ohl¹, A. Q. Liu¹

¹Nanyang Technological University, Singapore, ²Institute of High Performance Computing, A*STAR, Singapore

9B2 Bio Probes

16:30-17:30

9B2-1 (1631)

IODINE-TREATED STARCH AS EASY-TO-USE, BIODEGRADABLE MATERIAL WITH CONTROLLABLE SWELLING AND STIFFENING PROPERTIES

Daniel Egert, Rebecca L. Peterson, Khalil Najafi

University of Michigan, USA

9B2-2 (1566)

NEUROSPHEROID ARRAY ON A FLEXIBLE SUBSTRATE FOR CORTICAL MICROSTIMULATION

Keisuke Okita, Midori Negishi, Hiroaki Onoe, Shoji Takeuchi
Institute of Industrial Science, The University of Tokyo, Japan

9B2-3 (1682)

HIGH-SPEED ON-CHIP ENUCLEATION OF OOCYTE BY ROBOT INTEGRATED MICROFLUIDIC CHIP

Shinya Sakuma, Fumihito Arai
Nagoya University, Japan

Thursday, January 24, 2013

Poster/Oral Session 4

8:30-10:30

10A Switches & Probes

10:30-12:10

10A-1 (1557)

SILICON NANOWIRE ELECTROMECHANICAL SWITCHES WITH INTEGRATED PIEZORESISTIVE TRANSDUCERS

Rui Yang¹, Tina He¹, Carine Marcoux², Alexandra Koumela², Laurent Duraffourg², Philip X.-L. Feng¹

¹Case Western Reserve University, USA, ²CEA-Leti, France

10A-2 (1691)

10-25 NM PIEZOELECTRIC NANO-ACTUATORS AND NEMS SWITCHES FOR MILLIVOLT COMPUTATIONAL LOGIC

Usama Zaghoul, Gianluca Piazza
Carnegie Mellon University, USA

10A-3 (1591)

RF SWITCHES USING PHASE CHANGE MATERIALS

Yonghyun Shim, Gwendolyn Hummel, Mina Rais-Zadeh
University of Michigan, USA

10A-4 (1596)

NANOGAP MULTI-ELECTRODE ATOM AND CONDUCTIVITY PROBER

Kwame Amponsah, Amit Lal
Cornell University, USA

10A-5 (1551)

HEATED ATOMIC FORCE MICROSCOPE CANTILEVERS WITH WEAR-RESISTANT ULTRANANOCRYSTALLINE DIAMOND TIPS

Hoe Joon Kim¹, Nicolaie Moldovan², Jonathan R. Felts¹, Suhas Somnath¹, Zhenting Dai¹, Tevis D. B. Jacobs³, Robert W. Carpick³, John A. Carlisle², William P. King¹

¹University of Illinois at Urbana-Champaign, USA, ²Advanced Diamond Technologies Inc., USA,

³University of Pennsylvania, USA

10B Microfluidics

10:30-12:10

10B-1 (1599)

MICROMACHINED PIEZOELECTRIC SPIRALS AND ULTRA-COMPLIANT PACKAGING FOR BLOOD PRESSURE ENERGY HARVESTERS POWERING MEDICAL IMPLANTS

Martin Deterre¹, Elie Lefevre¹, Yanan Zhu¹, Marion Woytasik¹, Alain Bosseboeuf¹

¹Univ Paris-Sud, France, ²CNRS, France, ³Sorin Group, France

10B-2 (1290)**MAGNETIC VALVES WITH PROGRAMMABLE TIMING CAPABILITY FOR FLUID CONTROL IN PAPER-BASED MICROFLUIDICS**

Philip Zwanenburg, Xiao Li, Xinyu Liu
McGill University, Canada

10B-3 (1688)**MULTI-LAYERED PLACENTAL BARRIER STRUCTURE INTEGRATED WITH MICROFLUIDIC CHANNELS**

Shigenori Miura, Shoji Takeuchi
Institute of Industrial Science, The University of Tokyo, Japan

10B-4 (1769)**MICROFLUIDIC DEVICE FOR THE CONTINUOUS PREPARATION OF EUKARYOTIC CELLS FOR METABOLIC ANALYSIS**

Negar Rajabi, Janina Bahnemann, An-Ping Zeng, Joerg Mueller
Hamburg University of Technology, Germany

10B-5 (1387)**A MICROFLUIDIC DROPLET PLATFORM FOR MULTIPLEXED SINGLE NUCLEOTIDE POLYMORPHISM ANALYSIS OF AN ARRAY OF PLANT GENOMIC DNA SAMPLES**

Helena C. Zec, Tushar D. Rane, Vivian W. Wang, Tza-Huei Wang
Johns Hopkins University, USA

Award Announcement**12:10-12:30****POSTER ORAL SESSIONS****Monday Afternoon, January 21, 2013 13:30-15:30****Tuesday Afternoon, January 22, 2013 13:00-15:00****Wednesday Afternoon, January 23, 2013 13:00-15:00****Thursday Morning, January 24, 2013 8:30-10:30**

Poster Numbers end with: Mo (Monday), Tu (Tuesday), We (Wednesday) or Th (Thursday). Author of the paper is expected to stand by their poster during the interactive Poster Oral Session held on that day.

Fabrication Technologies**001-Mo (1117)****A ROOM TEMPERATURE, ZERO FORCE, WAFER-LEVEL ATTACHMENT METHOD FOR MEMS INTEGRATION**

Levent Beker, Ozge Zorlu, Haluk Kulah
METU MEMS Center, Turkey

002-Tu (1124)**WAFER-TO-WAFER SELECTIVE FLIP-CHIP TRANSFER BY STICKY SILICONE BONDING AND LASER DEBONDING FOR RAPID AND EASY INTEGRATION TEST**

Shuji Tanaka¹, Masaki Yoshida¹, Hideki Hirano¹, Toshihiro Somekawa², Masayuki Fujita², Masayoshi Esashi¹

¹Tohoku University, Japan, ²Institute for Laser Technology, Japan

003-We (1195)**PROCESS CONTROL MONITORS FOR SINGLE-WALLED CARBON NANOTUBE BASED SENSOR FABRICATION PROCESSES**

Kiran Chikkadi, Cosmin Roman, Christofer Hierold
ETH Zurich, Switzerland

004-Th (1210)

MICROPARTICLES IN SILICON FILM USING MIST-JET TECHNOLOGY FOR A PHOTODETECTOR

Yoshinori Yokoyama, Tomoyuki Takahata, Kiyoshi Matsumoto, Isao Shimoyama
The University of Tokyo, Japan

005-Mo (1224)

MICROASSEMBLY OF MEMS ACTUATORS AND SENSORS VIA MICRO-MASONRY

Yong Zhang, Hohyun Keum, Seok Kim
University of Illinois at Urbana-Champaign, USA

006-Tu (1227)

HIGH-PERFORMANCE, 3D-MICRO-TRANSFORMERS ON MULTILAYERED MAGNETIC METGLASS CORES

Ali Moazenzadeh, Nils Spengler, Ulrike Wallrabe
IMTEK, University of Freiburg, Germany

007-We (1233)

CENTRIFUGAL IMPRINTING DURING VITRIFICATION OF COLLAGEN HYDROGEL FOR HIGHLY BIOCOMPATIBLE MEMBRANE SCAFFOLD

Masashi Ikeuchi, Koji Ikuta
The University of Tokyo, Japan

008-Th (1238)

FLEXIBLE NEUROCAGE ARRAY FOR LIVE NEURAL NETWORK STUDY

Jungwook Park, Jerome Pine, Yu-Chong Tai
California Institute of Technology, USA

009-Mo (1253)

SIMPLE THROUGH SILICON INTERCONNECT VIA FABRICATION USING DRY FILLING OF SUB-MICRON AU PARTICLE FOR 3D MEMS

Kailing Shih¹, Masatsugu Nimura¹, Yukio Kanehira², Toshinori Ogashiwa², Jun Mizuno¹, Shuichi Shoji¹

¹Waseda University, Japan, ²Tanaka Kikinzoku Kogyo K.K., Japan

010-Tu (1261)

SIMPLE AND HIGH-THROUGHPUT FABRICATION OF LARGE-AREA AND MULTILAYER FLEXIBLE POLYMER FILM STRUCTURES FOR MICROFLUIDIC ORGANIC LIGHT EMITTING DIODE

Miho Tsuwaki¹, Jun Mizuno¹, Takashi Kasahara¹, Tomohiko Edura², Shigeyuki Matsunami², Juro Oshima², Chihaya Adachi², Shuichi Shoji¹

¹Waseda University, Japan, ²Kyushu University, Japan

011-We (1324)

DNA ORIGAMI ASSEMBLY ON PATTERNED SILICON BY AFM BASED LITHOGRAPHY

Toshiyuki Akishiba, Naoyuki Tamura, Takashi Ichii, Yoshikazu Hirai, Koji Sugano, Toshiyuki Tsuchiya, Hiroyuki Sugimura, Osamu Tabata
Kyoto University, Japan

012-Th (1364)

SEALLESS 3-D MICROFLUIDIC CHANNEL FABRICATION BY SACRIFICIAL CARAMEL TEMPLATE DIRECT-PATTERNING

Yuichiro Koyata, Masashi Ikeuchi, Koji Ikuta
The University of Tokyo, Japan

013-Mo (1422)

IONIC-LIQUID MICRO ION SOURCE ARRAY FOR FLEXIBLE CONCURRENT MEMS PROCESS

Tatsuya Suzuki, Motoaki Hara, Hiroyuki Oguchi, Hiroki Kuwano
Tohoku University, Japan

014-Tu (1431)

INTEGRATION OF SINGLE-WALLED CARBON NANOTUBE BUNDLE ON CANTILEVER BY DIELECTROPHORESIS

Takuma Chikamoto¹, Yuichiro Shimada¹, Mitsuo Umetsu², Masakazu Sugiyama³
¹BEANS Laboratory, Japan, ²Tohoku University, Japan, ³University of Tokyo, Japan

015-We (1445)

PIEZORESISTIVE CANTILEVER PROBES FOR SIMULTANEOUS NANOSCALE TOPOGRAPHY AND CONDUCTIVITY IMAGING

Yongliang Yang¹, Yue Ma¹, Alexandre Haemmerli¹, Keji Lai¹, Worasom Kundhikanjana¹, Nahid Harjee¹, Beth Pruitt¹, Xinxin Li², Michael Kelly¹
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016-Th (1452)

FORMATION AND CURVATURE TUNING OF MICRO LENS USING SURFACE TENSION AND HYDRAULIC PRESSURE ASSISTED MOLDING PROCESS

Fu-Ming Hsu, Weileun Fang, Chih-Chun Lee
National Tsing Hua University, Taiwan

017-Mo (1453)

SINGLE-STEP FABRICATION OF SUPERHYDROPHOBIC MICRO/NANO DUAL-SCALE PDMS FILM REPLICATED FROM ULTRA-LOW-SURFACE-ENERGY MOLD

Xiao-Sheng Zhang¹, Bai-Hong Jin¹, Shi-Gan Chu¹, Nicolas Peter², Fu-Yun Zhu¹, Hai-Xia Zhang¹
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018-Tu (1483)

CONE-SHAPED MICRO COIL FOR MAGNETIC RESONANCE IMAGING

Takahiro Inamura, Tetsuji Dohi
Chuo University, Japan

019-We (1568)

THREE DIMENSIONAL TRANSFORMATION OF PARYLENE THIN FILM STRUCTURES VIA THERMOFORMING

Brian J Kim, Benny Chen, Ellis Meng
University of Southern California, USA

020-Th (1598)

LOW TEMPERATURE ADHESIVE WAFER BONDING USING OSTE(+) FOR HETEROGENEOUS 3D MEMS INTEGRATION

Fredrik Forsberg, Farizah Saharil, Göran Stemme, Niclas Roxhed, Wouter van der Wijngaart, Tommy Haraldsson, Frank Niklaus
KTH Royal Institute of Technology, Sweden

021-Mo (1607)

METHODS FOR THE MICROFABRICATION OF MAGNESIUM

Melissa Tsang, Florian Herrault, Richard H. Shafer, Mark G. Allen
Georgia Institute of Technology, USA

022-Tu (1654)

FABRICATION OF SILICA NANOWIRE BUNCH ARRAYS IN SiO VAPOR GENERATED BY OXYGEN PLASMA ETCHING OF SILICON

Didi She, Lurui Zhao, Can Li, Fengqi Zhang, Guibing Cai, Wengang Wu

Peking University, China

023-We (1687)

TECHNOLOGY FOR FABRICATING DENSE 3-D MICROSTRUCTURE ARRAYS FOR BIOMIMETIC SENSORS

Yemin Tang, Rebecca L. Peterson, Khalil Najafi
University of Michigan, Ann Arbor, USA

024-Th (1711)

PENDANT LIPOSOME SYSTEM TO ACCESS THE INTERNAL SOLUTION

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025-Mo (1730)

DRIE OF FUSED SILICA

Zongliang Cao, Brian VanDerElzen, Kevin J. Owen, Jialiang Yan, Rebecca L. Peterson, Dennis Grimard, Khalil Najafi
University of Michigan, USA

026-Tu (1766)

VERIFICATION OF BENDING STRENGTH OF VAPOR-LIQUID-SOLID GROWN HIGH-ASPECT-RATIO SILICON-NEUROPROBES

Tatsuya Imashioya¹, Hideo Oi², Satoshi Yagi¹, Makoto Ishida¹, Takeshi Kawano¹
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027-We (1789)

VERTICAL CONTINUOUS FLOW LITHOGRAPHY FOR FABRICATING LONG 3D STRUCTURES

Shohei Habasaki, Shotaro Yoshida, Shoji Takeuchi
The University of Tokyo, Japan

Packaging Technologies

028-Th (1196)

HETERO MULTILAYER MICRO STRUCTURES BY RAPID PROTOTYPING FOR SIMULTANEOUS ENCAPSULATION AND INTERCONNECTION OF MICROCHIPS

Shingo Katano, Yumi Teramachi, Wataru Tonomura, Satoshi Konishi
Ritsumeikan University, Japan

029-Mo (1369)

FABRICATION AND PACKAGING PROCESS OF SILICON RESONATORS CAPABLE OF THE INTEGRATION OF LSI FOR APPLICATION OF TIMING DEVICE

Toan Van Nguyen¹, Hidetoshi Miyashita², Masaya Toda², Yusuke Kawai¹, Takahito Ono¹
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030-Tu (1645)

TEMPORARY WAFER BONDING AND DEBONDING BY ELECTRELEASER FOR THIN WAFER HANDLING IN 3D INTEGRATION

Hithesh K Gatty, Frank Niklaus, Göran Stemme, Niclas Roxhed
KTH Royal Institute of Technology, Sweden

Materials and Device Characterization

031-We (1021)

IRREVERSIBLE DEFORMATION OF MICRONS THICK SINGLE CRYSTAL SILICON IN A TEMPERATURE RANGE OF 350-500°C

Kazuo Sato, Akira Sugimoto, Tomo-omi Nishimura
Nagoya University, Japan

032-Th (1065)

EFFECTS OF DEPOSITION TEMPERATURE ON PARYLENE-C PROPERTIES

Dongyang Kang¹, Andrew Standley², Jay Han-Chieh Chang¹, Yang Liu¹, Yu-Chong Tai¹

¹California Institute of Technology, USA, ²University of Cambridge, UK

033-Mo (1094)

SUBSTRATE EFFECT IN SQUEEZE FILM DAMPING OF LATERAL OSCILLATING MICROSTRUCTURES

Mo Li, Vashwar T. Rouf, David A. Horsley

University of California, Davis, USA

034-Tu (1096)

THE ROLE OF DISSOLVED GAS IN LONGEVITY OF CASSIE STATES FOR IMMERSSED SUPERHYDROPHOBIC SURFACES

Wei-Yang Sun, Chang-Jin "CJ" Kim

University of California, Los Angeles, USA

035-We (1098)

ARTICULATION OF ANGLED SEMICIRCULAR MICROFIBERS FOR A GECKO-INSPIRED ANISOTROPIC ADHESIVE

Sathya Chary, John Tamelier, Kimberly L. Turner

University of California, Santa Barbara, USA

036-Th (1109)

TOPOLOGY OPTIMIZATION METHOD USING MULTI-STEP MAPPING FROM 2D PHOTOMASK TO 3D MEMS

Takashi Ozaki, Tsuyoshi Nomura, Norio Fujitsuka, Keiichi Shimaoka, Teruhisa Akashi

TOYOTA CENTRAL R&D LABS. INC., Japan

037-Mo (1149)

DC AND AC ELECTROTHERMAL CHARACTERIZATION OF HEATED MICROCANTILEVERS USING SCANNING THERMOREFLECTANCE MICROSCOPY

Joohyun Kim¹, Sunwoo Han², Keunhan Park³, Bong-Jae Lee², William P. King⁴, Jungchul Lee¹

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³University of Rhode Island, USA, ⁴University of Illinois at Urbana-Champaign, USA

038-Tu (1179)

LINEAR ACTUATION PIEZOELECTRIC MICROCANTILEVER USING TETRAGONAL COMPOSITION PZT THIN FILMS

Takeshi Kobayashi¹, Natsumi Makimoto¹, Takahiro Oikawa², Ayumi Wada², Hiroshi Funakubo², Ryutaro Maeda¹

¹National Institute of Advanced Industrial Science and Technology (AIST), Japan, ²Tokyo Institute of Technology, Japan

039-We (1316)

MEASURES OF QUALITY-FACTOR IN GAP-CLOSING ELECTROSTATIC RESONATORS

Shai Shmulevich, David Elata

Technion - Israel Institute of Technology, Israel

040-Th (1399)

INFRARED-TO-VISIBLE TRANSDUCERS USING TEMPERATURE SENSITIVE EU(TTA)₃ ON SELF-SUSPENDED THIN FILM FOR INEXPENSIVE THERMAL IMAGING DEVICE

Takashiro Tsukamoto, Masayoshi Esashi, Shuji Tanaka

Tohoku University, Japan

041-Mo (1476)

MECHANICAL STRENGTHENING OF SILICON TORSION BAR OF MEMS SCANNING MIRROR BY HYDROGEN ANNEAL

Ryo Hajika, Shinya Yoshida, Wataru Makishi, Yoshiaki Kanamori, Shuji Tanaka, Masayoshi Esashi
University of Tohoku, Japan

042-Tu (1477)

COMSTHERMOPILES USING VERTICALLY INTEGRATED DOUBLE POLYCRYSTALLINE SILICON LAYERS

Huchuan Zhou¹, Piotr Kropelnicki², J. M. Tsai², Chengkuo Lee¹

¹National University of Singapore, Singapore, ²Institute of Microelectronics, Singapore

043-We (1496)

FUNCTIONALIZED GOLD-NANOPARTICLES DIRECTLY GROWN ON GRAPHENE-OXIDE SHEETS TO FORM POROUS-STACKED SENSING MATERIAL FOR MICRO-GRAVIMETRIC GAS SENSING

Haitao Yu, Pengcheng Xu, Xinxin Li

Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China

044-Th (1512)

LOW VOLTAGE FIELD EMISSION FROM PZT-COATED SILICON NANOTIPS

Patrick C. Fletcher, Vengadesh Mangalam, Lane W. Martin, William P. King

University of Illinois at Urbana-Champaign, USA

045-Mo (1570)

CHARACTERIZATION AND FABRICATION OF ZINC OXIDE NANOWIRE DEVICES

Wei-Chih Lin¹, Yu-Ching Lin², Takanari Saito³, Chin-Jui Shih⁴, Jun-ichi Shirakashi³, Masayoshi Esashi², Ashwin A. Seshia¹

¹Nanoscience Centre, University of Cambridge, UK, ²WPI-AIMR, Tohoku University, Japan, ³Tokyo University of Agriculture & Technology, Japan, ⁴National Taiwan University, Taiwan

046-Tu (1592)

INVESTIGATION OF CONTACT RESISTANCE EVOLUTION OF IR, PT, NI, W, CR, TI, CU AND AL OVER REPEATED HOT-CONTACT SWITCHING FOR NEMS SWITCHES

Faisal K. Chowdhury, Hoorad Pourzand, Massood Tabib-Azar

University of Utah, USA

047-We (1632)

COMBUSTION AND MATERIAL CHARACTERIZATION OF POROUS SILICON NANOENERGETICS

Nicholas W. Piekiel, Wayne A. Churaman, Christopher J. Morris, Luke J. Currano

Army Research Laboratory, USA

048-Th (1634)

3D GENERAL PHOTOCURABLE MODEL OF RESIN WITH VARIOUS KINDS OF MICROPARTICLES

Masato Yasui¹, Koji Ikuta²

¹Osaka University, Japan, ²University of Tokyo, Japan

049-Mo (1635)

CHARACTERIZATION OF SOLID UV CROSS-LINKED PEGDA FOR BIOLOGICAL APPLICATIONS

David Castro¹, Patrick Ingram², Rimantas Kodzius¹, David Conchouso¹, Euisik Yoon², Ian G. Foulds¹

¹King Abdullah University of Science and Technology, Saudi Arabia, ²University of Michigan, USA

050-Tu (1652)

FRACTURE LIMIT IN THIN-FILM PIEZOELECTRIC-ON-SUBSTRATE RESONATORS: SILICON VS. DIAMOND

Hediyeh Fatemi, Reza Abdolvand

Oklahoma State University, USA

051-We (1676)

CORE-SHELL MAGNETIC NANOPARTICLES FOR ON-CHIP RF INDUCTORS

Kisik Koh¹, Jeaneun Park¹, Jungwon Park², Liwei Lin¹

¹University of California, Berkeley, USA, ²Harvard University, USA

052-Th (1737)

ADAPTABLE TEST-BED FOR CHARACTERIZATION OF MICRO-WINEGLASS RESONATORS

Doruk Senkal, Mohammed J. Ahamed, Alexander A. Trusov, Andrei M. Shkel

University of California, Irvine, USA

053-Mo (1747)

PAPER-BASED STRAIN SENSING MATERIAL

Ehsan Khajeh, Boris Stoeber

The University of British Columbia, Canada

054-Tu (1761)

MICROMACHINED TIP-TO-PLATE CORONA DISCHARGER WITH SLIT DIELECTRIC BARRIER FOR MEASURING THE AIRBORNE PARTICLE NUMBER CONCENTRATION

Hong-Lae Kim, Sang-Myun Lee, Chul Woo Park, Jungho Hwang, Yong-Jun Kim

Yonsei University, Korea

055-We (1767)

SELF-CURLING AND -STICKING FLEXIBLE SUBSTRATE FOR ECG ELECTRODE ARRAY

Shota Yamagiwa, Makoto Ishida, Takeshi Kawano

Toyohashi University of Technology, Japan

056-Th (1772)

ALD ALUMINIUM OXIDE AS PROTECTIVE COATING AGAINST WET OXIDATION OF LPCVD SIC MICROHOTPLATE.

Bruno Morana, Giuseppe Fiorentino, Gregory Pandraud, Fredrik Creemer, Pasqualina M. Sarro

Technical University of Delft (TUDelft), Netherlands

057-Mo (1791)

DIRECT TENSILE TESTING OF SUB-100NM-SIZE SILICON NANOWIRES FABRICATED BY FIB-SAMPLING OF SON MEMBRANES

Tatsuya Fujii¹, Koichi Sudoh², Shozo Inoue¹, Takahiro Namazu¹

¹University of Hyogo, Japan, ²Osaka University, Japan, ³JST PRESTO, Japan

Nano-Electro-Mechanical Devices and Systems

058-Tu (1043)

IN-PLANE FABRICATED INSULATED GOLD-TIP PROBE FOR ELECTROCHEMICAL AND MOLECULAR EXPERIMENTS

Yexian Wu, Terunobu Akiyama, Sebastian Gautsch, Peter D. van der Wal, Nico F. de Rooij

Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

059-We (1075)

SUSPENDED CNT-FET PIEZORESISTIVE STRAIN GAUGES: CHIRALITY ASSIGNMENT AND QUANTITATIVE ANALYSIS

Matthias Muoth, Kiran Chikkadi, Yu Liu, Christofer Hierold

ETH Zurich, Switzerland

060-Th (1146)

OPTICAL WAVELENGTH SIGNAL DETECTOR VIA TUNABLE MICRO-RING RESONATOR FOR SENSOR APPLICATIONS

Ji Fang Tao¹, Ai Qun Liu¹, Hong Cai², Jian Wu³

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³Beijing University of Posts and Telecommunications, China

061-Mo (1207)

OPTICALLY CONTROLLABLE SI PHOTOCATHODE ARRAY

Yujiro Tanaka, Masatoshi Miyashita, Masayoshi Esashi, Takahito Ono
Tohoku University, Japan

062-Tu (1330)

ELECTRICAL CONDUCTIVITY AND SEEBECK COEFFICIENT MEASUREMENT OF SINGLE NANOWIRES BY UTILIZING A MICROFABRICATED THERMOELECTRIC NANOWIRE CHARACTERIZATION PLATFORM

Zhi Wang, Michael Kroener, Peter Woias
University of Freiburg, Germany

063-We (1521)

TRANSPARENT AND FLEXIBLE TOLUENE SENSOR WITH ENHANCED SENSITIVITY USING ADSORPTION CATALYST-FUNCTIONALIZED GRAPHENE

Jungwook Choi, Soonjae Pyo, Kyoungsoon Lee, Hee-Jin Ko, Jongbaeg Kim
Yonsei University, Korea

064-Th (1543)

ROBUST SILICON CARBIDE (SiC) NANOELECTROMECHANICAL SWITCHES WITH LONG CYCLES IN AMBIENT AND HIGH TEMPERATURE CONDITIONS

Tina He¹, Rui Yang¹, Srihari Rajgopal¹, Mary Anne Tupta², Swarup K. Bhunia¹, Mehran Mehregany¹, Philip X.-L. Feng¹

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065-Mo (1587)

LATERALLY ACTUATED NANOELECTROMECHANICAL RELAYS WITH COMPLIANT, LOW RESISTANCE CONTACT

Mohammad Shavezipur, William S. Lee, Kimberley L. Harrison, J Provine, Subhasish Mitra, H.-S. P. Wong, Roger T. Howe
Stanford University, USA

Micro-Actuators

066-Tu (1041)

ACTIVE CMOS-MEMS DUAL PROBE ARRAY FOR STM BASED PARALLEL IMAGING AND NANO-PATTERNING

Yang Zhang, Yingying Tang, L. Richard Carley, Gary K. Fedder
Carnegie Mellon University, USA

067-We (1049)

A NOVEL CONTINUOUSLY VARIABLE ANGULAR VERTICAL COMB-DRIVE WITH APPLICATION IN SCANNING MICROMIRROR

Ralf Bauer, Gordon Brown, Li Li, Deepak Uttamchandani
University of Strathclyde, UK

068-Th (1199)

PANTOGRAPH MECHANISM FOR CONVERSION FROM SWELLING INTO CONTRACTION MOTION OF PNEUMATIC BALLOON ACTUATOR

Takuya Chishiro, Taiki Ono, Satoshi Konishi
Ritsumeikan University, Japan

069-Mo (1140)

MICRO ACTUATOR ARRAY ON A FLEXIBLE SHEET - SMART MEMS SHEET -

Manabu Ataka, Hiroyuki Fujita
University of Tokyo, Japan

070-Tu (1204)

AUTONOMOUSLY MOVABLE BIMETALLIC MICROMOTOR IN BIOFUEL

Yoshitaka Yoshizumi, Yusuke Date, Kyohei Ohkubo, Masatoshi Yokokawa, Hiroaki Suzuki
University of Tsukuba, Japan

071-We (1245)

THE INTEGRATION OF TIOPC-BASED OPTOELECTRONIC TWEEZERS AND OPTOELECTROWETTING WITH FREQUENCY MODULATION

Weng Chio Ho¹, Tung-Ming Yu², Ming-Huei Liu³, Long Hsu², Cheng-Hsien Liu¹

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072-Th (1325)

MAGNETICALLY-ACTUATED VARIABLE OPTICAL ATTENUATORS USING FERROFLUID-DOPED ELASTOMER IMPLEMENTED BY COMBINATION OF SOFT LITHOGRAPHY AND INK JET PRINTING TECHNOLOGIES

Sandra de Pedro¹, Víctor J. Cadarso², Xavier Muñoz-Berbel¹, Juergen Brugger², Stephanus Büttgenbach³, Andreu Llobera¹

¹CNM-IMB-CSIC Barcelona, Spain, ²Mycrosystems Laboratory EPFL, Switzerland, ³Institut für Mikrotechnik, Germany

074-Tu (1379)

DEVELOPMENT OF NOVEL MICROACTUATORS DRIVEN BY LIQUID CRYSTALLINE MATERIALS

Shigeomi Chono, Tomohiro Tsuji
Kochi University of Technology, Japan

075-We (1423)

A MAGNETICALLY DRIVEN MICROMANIPULATOR INCORPORATED WITH A BUBBLE FOR BIO/MICRO-OBJECT MANIPULATION

Il Song Park, Jae Hun Shin, Young Rang Lee, Sang Kug Chung
Myongji University, Korea

076-Th (1455)

DESIGN, FABRICATION AND CHARACTERIZATION OF A SUSPENDED PLATE MECHANO-OPTICAL MODULATOR

Mubassira B Syed Nawazuddin¹, Meint de Boer¹, Erwin J Berenschot¹, Ke Chun Ma¹, Miko C Elwenspoek², Remco J Wiegerink¹

¹MESA+ Institute for Nanotechnology, University of Twente, Netherlands, ²FRIAS, University of Freiburg, Germany

077-Mo (1581)

SUPER-PARAMAGNETIC SWIMMING MICROROBOTS WITH ADJUSTED MAGNETIC ANISOTROPY

Christian Peters¹, Olgac Ergeneman², Bradley J Nelson², Christofer Hierold¹

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078-Tu (1605)

WRINKLE MEETS MEMS: TUNABLE GRATING AND HYDROPHOBIC SURFACE

Atsushi Takei, Hiroyuki Fujita
University of Tokyo, Japan

079-We (1614)

LOW-VOLTAGE ENHANCED ACTUATION MEMS CANTILEVERS USING AL₂O₃-SiO₂ ELECTRETS

Pradeep Pai, Massood Tabib-Azar
University of Utah, USA

080-Th (1726)

A 3-DOF PIEZOELECTRIC MICRO VIBRATORY STAGE BASED ON BULK-PZT/SILICON

CRAB-LEG SUSPENSIONS

Ethem Erkan Aktakka, Rebecca L. Peterson, Khalil Najafi
University of Michigan, Ann Arbor, USA

081-Mo (1740)

PARAMETRICALLY DRIVEN RESONANT MICRO-MIRROR SCANNER WITH TUNABLE SPRINGS

Jinhyeok Kim, Yusuke Kawai, Naoki Inomata, Takahito Ono
Tohoku University, Japan

082-Tu (1831)

PNEUMATIC-LESS HIGH-SPEED VACUUM MESO-PUMP DRIVEN BY PROGRAMMABLE HYDRAULICS

Jiyoung Son, Hyun Tae Kim, Hanseup Kim
University of Utah, USA

Mechanical Sensors and Systems

083-We (1005)

PIEZOELECTRIC PARAMETRIC AMPLIFIERS WITH INTEGRATED ACTUATION AND SENSING CAPABILITIES

Olivier Thomas¹, Fabrice Mathieu², William Mansfield³, Changjun Huang³, Susan Trolier-McKinstry³, Liviu Nicu²

¹Centre National Arts et Metiers, France, ²Center of National Scientific Research, France,

³Pennsylvania State University, USA

084-Th (1019)

5.4 MHZ DOG-BONE OSCILLATING AFM PROBE WITH THERMAL ACTUATION AND PIEZO-RESISTIVE DETECTION

Zhuang Xiong, Estelle Mairiaux, Benjamin Walter, Marc Faucher, Lionel Buchailot, Bernard Legrand

IEMN(Institut d'Electronique, de Microélectronique et de Nanotechnologie), France

085-Mo (1076)

HIGHLY SENSITIVE PRESSURE SENSOR USING A GOLD-COATED ELASTIC PYRAMID ARRAY PRESSING ON A RESISTOR

Nguyen Thanh-Vinh, Kiyoshi Matsumoto, Isao Shimoyama
The University of Tokyo, Japan

086-Tu (1077)

AN INERTIAL MICRO-SWITCH WITH COMPLIANT CANTILEVER FIXED ELECTRODE FOR PROLONGING CONTACT TIME

Yan Wang, WenGuo Chen, Zhuoqing Yang, Guifu Ding, Hong Wang, Xiaolin Zhao
Shanghai JiaoTong University, China

087-We (1093)

QUADRATURE FM GYROSCOPE

Mitchell H Kline¹, Yu-Ching Yeh¹, Burak Eminoglu¹, David A Horsley², Bernhard E Boser¹, Mike Daneman³

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088-Th (1143)

OPTICAL ACCELEROMETER WITH MECHANICAL AMPLIFICATION VIA A V-BEAM MECHANISM

Edward Davies¹, David S. George², Malcolm C. Gower¹, Andrew S. Holmes¹

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089-Mo (1168)

A CMOS MEMS CAPACITIVE ULTRASONIC SENSOR ARRAY FOR THREE-DIMENSIONAL

PHOTOACOUSTIC IMAGING

Pei-Liang Liao, Po-Hsun Wang, Meng-Lin Li, Michael Lu
National Tsing Hua University, Taiwan

090-Tu (1249)

A SENSITIVE LIQUID-CANTILEVER DIAPHRAGM FOR PRESSURE SENSOR

Minh-Dung Nguyen, Isao Shimoyama, Kyoshi Matsumoto
The University of Tokyo, Japan

091-We (1274)

PIEZORESISTIVE MEMBRANE-TYPE SURFACE STRESS SENSOR ARRANGED IN ARRAY FOR CANCER DIAGNOSIS THROUGH BREATH ANALYSIS

Frédéric Loizeau¹, Hans Peter Lang², Terunobu Akiyama¹, Sebastian Gautsch¹, Peter Vettiger¹, Genki Yoshikawa³, Christoph Gerber², Nico F. de Rooij¹
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092-Th (1291)

EPITAXIALLY-ENCAPSULATED POLYSILICON DISK RESONATOR GYROSCOPE

Sarah H. Nitzan¹, Chae H. Ahn², Tsang-Hung Su¹, Mo Li¹, Eldwin J. Ng², Shasha Wang², Bernhard E. Boser⁴, Anthony D. Challoner³, Thomas W. Kenny²
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093-Mo (1294)

DEVELOPMENT OF A MICRO SEISMOMETER BASED ON MOLECULAR ELECTRONIC TRANSDUCERS TECHNOLOGY FOR PLANETARY EXPLORATION

Hai Huang¹, Bryce Carande¹, Rui Tang¹, Jon Oiler¹, Agafonov Vadim², Hongyu Yu¹
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094-Tu (1296)

A MICROMACHINED SQUARE EXTENSIONAL MODE RESONANT MAGNETOMETER WITH DIRECTLY VOLTAGE OUTPUT

Guoqiang Wu, Dehui Xu, Bin Xiong, Yuelin Wang
Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China

095-We (1354)

TACTICAL GRADE MICRO GYROSCOPE WITH DUAL CAPACITIVE/OPTICAL SENSING

Ronen Maimon¹, Oren Lahav¹, Yuval Gerson², Ohad Zohar¹, Hanoach Berko¹, Slava Krylov²
¹RAFAEL, Israel, ²Tel-Aviv University, Israel

096-Th (1406)

AN ON-CHIP OPTO-MECHANICAL ACCELEROMETER

Bin Dong¹, Ai Qun Liu¹, Hong Cai², Julius Ming Lin Tsai², Dim Lee Kwong²
¹Nanyang Technological University, Singapore, ²Institute of Microelectronics, A*Star, Singapore

097-Mo (1416)

ROTATIONAL MOTION EFFECT ON SENSITIVITY MATRIX OF MEMS THREE-AXIS ACCELEROMETER FOR REALIZATION OF CONCURRENT CALIBRATION USING VIBRATION TABLE

Atsushi Nakano¹, Yoshikazu Hirai¹, Koji Sugano¹, Toshiyuki Tsuchiya¹, Osamu Tabata¹, Akira Umeda²
¹Kyoto University, Japan, ²AIST/Vector Dynamics Corporation, Japan

098-Tu (1572)

A COMBINED COMB / BULK MODE GYROSCOPE STRUCTURE FOR ENHANCED SENSITIVITY

Mohannad Y. Elsayed¹, Frederic Nabki², Mourad N. El-Gamal¹
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099-We (1616)

NONLINEARITY-ASSISTED FREQUENCY STABILIZATION FOR NANOWIRE ARRAY MEMBRANE OSCILLATOR

Yuerui Lu, Amit Lal
Cornell University, USA

100-Th (1620)

SI-CMOS-MEMS DUAL MASS RESONATOR FOR EXTRACTING MASS AND SPRING VARIATIONS

Yu-Jen Fang, Tamal Mukherjee, Gary K. Fedder
Carnegie Mellon University, USA

101-Mo (1625)

BATCH-FABRICATED MEMS RETARDING POTENTIAL ANALYZER FOR HIGH-ACCURACY ION ENERGY MEASUREMENTS

Eric V. Heubel, Luis F. Velásquez-García
Massachusetts Institute of Technology, USA

102-Tu (1660)

A HIGHLY-COMPLIANT ASYMMETRIC 2D GUIDED-MODE RESONANCE SENSOR FOR SIMULTANEOUS MEASUREMENT OF DUAL-AXIS STRAIN

Steven J. Foland, Jeong-Bong (J.B.) Lee
The University of Texas at Dallas, USA

103-We (1677)

FABRICATION AND CHARACTERIZATION OF 3D MICRO-PLASMA FIELD EFFECT TRANSISTORS

Faisal K. Chowdhury, Yuying Zhang, Massood Tabib-Azar
University of Utah, USA

104-Th (1684)

HIGH SENSITIVITY, HIGH DENSITY MICRO-HYDRAULIC FORCE SENSOR ARRAY UTILIZING STEREO-LITHOGRAPHY FABRICATION TECHNIQUE

Mahdi M. Sadeghi, Karen Dowling, Rebecca L. Peterson, Khalil Najafi
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105-Mo (1705)

FABRICATION AND TESTING OF HEMISPHERICAL MEMS WINEGLASS RESONATORS

Pradeep Pai, Faisal K. Chowdhury, Massood Tabib-Azar
University of Utah, USA

106-Tu (1721)

STRETCHABLE FORCE SENSOR ARRAY USING CONDUCTIVE LIQUID

Kentaro Noda, Kiyoshi Matsumoto, Isao Shimoyama
The University of Tokyo, Japan

107-We (1752)

A NOVEL MAGNETOSTRICTIVE TYPE PRESSURE SENSOR WITH PLANAR SENSING INDUCTOR

Heng-Chung Chang¹, Sheng-Chieh Liao¹, Hsieh-Shen Hsieh², Su-Jhen Lin¹, Chih-Huang Lai¹, Weileun Fang¹

¹National Tsing Hua University, Taiwan, ²Delta Electronics, Inc., Taiwan

108-Th (1765)

INTEGRATING SOLDER BUMPERS FOR HIGH SHOCK APPLICATIONS

Aifric Delahunty, William T. Pike

Imperial College London, UK

Physical MEMS (Optical, Thermal, Magnetic)

109-Mo (1015)

3D LORENTZ FORCE MAGNETIC SENSOR USING ULTRA-THIN PIEZORESISTIVE CANTILEVERS

Sikornron Wattanasarn, Kiyoshi Matsumoto, Isao Shimoyama
The University of Tokyo, Japan

110-Tu (1086)

MONOLITHIC COMPOSITE-SENSORS DESIGNED AND FABRICATED BY A LOW-COST SINGLE-SIDE 'Si/POLY-Si/Al' MULTI-USER PROCESS-MODULE FOR VERSATILE SENSING-NETWORK NODES

Zao Ni, Xinxin Li, Chen Yang
Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China

111-We (1129)

SPIRAL METAMATERIAL FOR TUNABLE CHIRICAL DICHROISM

Tetsuo Kan¹, Akihiro Isozaki¹, Natsuki Kanda², Natsuki Nemoto¹, Kuniaki Konishi¹, Makito Kuwata-Gonokami¹, Kiyoshi Matsumoto¹, Isao Shimoyama¹

¹The University of Tokyo, Japan, ²RIKEN, Japan

113-Mo (1258)

A MICROPLAMA CHIP FOR VUV LIGHT SOURCE

Ryoto Sato¹, Daisuke Yasumatsu¹, Shinya Kumagai¹, Masaru Hori², Minoru Sasaki¹

¹Toyota Technological Institute, Japan, ²Nagoya University, Japan

114-Tu (1308)

FLEXIBLE AND LARGE-AREA SOUND-EMITTING DEVICE USING REDUCED GRAPHENE OXIDE

He Tian, Yi Yang, Dan Xie, Tian-Ling Ren, Yi Shu, Chang-Jian Zhou, Lu-Qi Tao, Li-Tian Liu
Tsinghua University, China

115-We (1346)

THZ POLARIZER USING TUNABLE METAMATERIALS

Wu Zhang¹, Wei Ming Zhu¹, Julius Tsai², Guo Qiang Lo², Dim Lee Kwong², Er Ping Li³, Ai Qun Liu¹

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116-Th (1394)

NANO ACTUATOR AND PULL-BACK NONLINEARITY

Min Ren¹, Ai Qun Liu¹, Hong Cai², L. M. Julius Tsai², Dim Lee Kwong²

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117-Mo (1745)

MEMS RESONANT MAGNETIC FIELD SENSOR BASED ON AN ALN/FEGAB BILAYER NANO-PLATE RESONATOR

Yu Hui, Tianxiang Nan, Nian X. Sun, Matteo Rinaldi
Northeastern University, USA

118-Tu (1459)

METAMATERIAL TUNABLE FILTER WITH LIQUID METAL

Weiming Zhu¹, Wu Zhang¹, Ruifeng Huang², Sing Kwong Ting², Dim Lee Kwong³, Ai Qun Liu¹

¹Nanyang Technological University, Singapore, ²Temasek Laboratories, Singapore, ³Institute of Microelectronics, Singapore

119-We (1809)

DESIGN AND IMPLEMENTATION OF TIME-DELAY SWITCH TRIGGERED BY INERTIA LOAD

Yu-Che Huang¹, Wei-Lun Sung¹, Wei-Cheng Lai¹, Chang-Yi Liu², Weileun Fang¹

¹National Tsing Hua University, Taiwan, ²Chung-Shan Institute of Science and Technology, Taiwan

RF MEMS

120-Th (1020)

PIEZOELECTRIC PROPERTIES OF SCALN THIN FILMS FOR PIEZO-MEMS DEVICES

Keiichi Umeda¹, Hiroshi Kawai¹, Atsushi Honda¹, Morito Akiyama², Takatoshi Kato¹, Tadao Fukura¹

¹Murata Manufacturing Co., Ltd., Japan, ²National Institute of Advanced Industrial Science and Technology, Japan

121-Mo (1024)

A LOW PHASE-NOISE VCO FOR MULTI-BAND TRANSCEIVER USING FULLY PACKAGED MEMS ELECTROSTATIC VARACTORS

Kenichiro Urayama¹, Koichiro Akahori¹, Nobuyuki Adachi¹, Hiroyuki Fujita², Hiroshi Toshiyoshi³

¹Japan Radio Co., Ltd., Japan, ²IIS, The University of Tokyo., Japan, ³The University of Tokyo, Japan

122-Tu (1141)

A 17.6-MHZ 2.5V ULTRA-LOW POLARIZATION VOLTAGE MEMS OSCILLATOR USING AN INNOVATIVE HIGH GAIN-BANDWIDTH FULLY DIFFERENTIAL TRANS-IMPEDANCE VOLTAGE AMPLIFIER

Tung-Tsun Chen¹, Jui-Cheng Huang¹, Yung-Chow Peng¹, Chia-Hua Chu¹, Chung-Hsien Lin¹, Chun-Wen Cheng¹, Sheng-Shian Li², Sheng-Shian Li²

¹Taiwan Semiconductor Manufacturing Company, Taiwan, ²National Tsing Hua University, Taiwan

123-We (1181)

ROOM-TEMPERATURE THZ IMAGING BASED ON ANTENNA-COUPLED MOSFET BOLOMETER

Thomas Morf¹, Bernhard Klein¹, Michel Despont¹, Ute Drechsler¹, Lukas Kull¹, Dan Corcos², Danny Elad², Noam Kaminski², Matthias Braendli¹

Thomas Toifl¹

¹IBM Research - Zurich, Switzerland, ²IBM Research - Haifa, Israel

124-Th (1218)

ANALYSIS OF NONLINEARITY DEGRADATION IN MULTI-STAGE RF MEMS CIRCUITS

Umer Shah, Mikael Sterner, Joachim Oberhammer

KTH Royal Institute of Technology, Sweden

125-Mo (1264)

AN ULTRA-LOW POWER OVENIZED CMOS-MEMS RESONATOR MONOLITHICALLY INTEGRATED WITH INTERFACE CIRCUITS

Ming-Huang Li, Cheng-Syun Li, Chi-Hang Chin, Chao-Yu Chen, Sheng-Shian Li

National Tsing Hua University, Taiwan

126-Tu (1272)

ELECTRONIC TUNING OF Q AND APPARENT TCF IN A PIEZORESISTIVE MICROMECHANICAL RESONATOR

Haoshen Zhu, Cheng Tu, Joshua E.-Y. Lee

City University of Hong Kong, Hong Kong, China

127-We (1293)

CRYSTALLOGRAPHIC AND EIGENMODE DEPENDENCE OF TCF FOR SINGLE CRYSTAL SILICON CONTOUR MODE RESONATORS

Haoshen Zhu, Guangcun Shan, Cheng Tu, Joshua E.-Y. Lee

City University of Hong Kong, Hong Kong, China

128-Th (1458)
ENHANCEMENT OF TEMPERATURE STABILITY VIA
CONSTANT-STRUCTURAL-RESISTANCE CONTROL FOR MEMS RESONATORS
Cheng-Chi Chen, Huan-Tse Yu Yu, Kuan-Hsten Lee, Sheng-Shian Li
National Tsing Hua University, Taiwan

129-Mo (1469)
MICROWAVE POWER LIMITERS BASED ON RF-MEMS
Jonathan Gauvin¹, Olivier Vendier², Jean Louis Cazaux², Pierre Blondy¹
¹XLIM - Université de Limoges, France, ²Thales Alenia Space, France

130-Tu (1516)
WAFER LEVEL PACKAGING FOR RF MEMS DEVICES USING VOID FREE COPPER FILLED
THROUGH GLASS VIA
Ju-Yong Lee, Sung-Woo Lee, Seung-Ki Lee, Jae-Hyoung Park
Dankook University, Korea

131-We (1554)
COMPARISON OF F-Q SCALING IN WINEGLASS AND RADIAL MODES IN RING
RESONATORS
Siddharth Tallur, Sunil A. Bhave
Cornell University, USA

132-Th (1582)
NONLINEAR UHF QUARTZ MEMS OSCILLATOR WITH PHASE NOISE REDUCTION
David T. Chang, Harris P. Moyer, Robert G. Nagele, Randall L. Kubena, Richard J. Joyce, Deborah
J. Kirby, Peter D. Brewer, Hung D. Nguyen, Frederic P. Stratton
HRL Laboratories, LLC, USA

133-Mo (1648)
MULTI-FREQUENCY WIDEBAND RF FILTERS USING HIGH ELECTROMECHANICAL
COUPLING LATERALLY VIBRATING LITHIUM NIOBATE MEMS RESONATORS
Songbin Gong, Gianluca Piazza
Carnegie Mellon University, USA

134-Tu (1680)
TWO-PORT FILTERS AND RESONATORS ON ALN/3C-SIC PLATES UTILIZING
HIGH-ORDER LAMB WAVE MODES
Chih-Ming Lin¹, Yung-Yu Chen², Valery V. Felmetzger³, Debbie G. Senesky⁴, Albert P. Pisano¹
¹University of California at Berkeley, USA, ²Tatung University, Taiwan, ³OEM Group Incorporated,
USA, ⁴Stanford University, USA

135-We (1706)
NONLINEARITY REDUCTION IN SILICON RESONATORS BY DOPING AND
RE-ORIENTATION
Mohsen Shahmohammadi, Hedyeh Fatemi, Reza Abdolvand
Oklahoma State University, USA

Energy Harvesting and Power MEMS

136-Th (1080)
DIRECT PROTOTYPING OF 3D MICRO SUPERCAPACITORS BASED ON IN-SITU
FABRICATED NANOPOROUS CARBON ELECTRODES
Caiwei Shen, Xiaohong Wang, Siwei Li, Xiaoming Wu
Tsinghua University, China

137-Mo (1106)
THERMAL ENERGY HARVESTING USING AN ELECTROSTATIC GENERATOR
Shankar K. T. Ravindran, Prashant Nilkund, Michael Kroener, Peter Woias

University of Freiburg, Germany

138-Tu (1206)

AN ELECTROMAGNETIC ENERGY HARVESTER FOR LOW FREQUENCY AND LOW-G VIBRATIONS WITH A MODIFIED FREQUENCY UP CONVERSION METHOD

Özge Zorlu¹, Serol Türkyılmaz¹, Ali Muhtaroglu², Haluk Külah¹

¹METU MEMS Center, Turkey, ²METU NCC, Turkey

139-We (1232)

A MICROFABRICATED PAPER-BASED MICROBIAL FUEL CELL

Sayantika Mukherjee¹, Arwa Fraiwan², Steven Sundermier², Seokheun Choi²

¹University of Cincinnati, USA, ²State University of New York at Binghamton, USA

140-Th (1299)

A LOW-COST, HIGH-EFFICIENCY AND HIGH-OUTPUT-POWER NANOFLUIDIC ENERGY HARVESTER

Wei Ouyang, Wei Wang, Haixia Zhang, Wengang Wu, Zhihong Li

Peking University, China

141-Mo (1335)

WIDEBAND MEMS ELECTROSTATIC VIBRATION ENERGY HARVESTERS BASED ON GAP-CLOSING INTERDIGITED COMBS WITH A TRAPEZOIDAL CROSS SECTION

Raphaël Guillemet¹, Philippe Basset¹, Dimitri Galayko², Francesco Cottone¹, Frédéric Marty¹, Tarik Bourouina¹

¹Université Paris-Est, France, ²Universités UPMC-Sorbonne, France

142-Tu (1327)

PROOF MASS EFFECTS ON SPIRAL ELECTRODE D33 MODE PIEZOELECTRIC DIAPHRAGM-BASED ENERGY HARVESTER

Zhiyuan Shen¹, Shuwei Liu¹, Jianmin Miao¹, Sun Woh Lye¹, Zhihong Wang²

¹Nanyang Technological University, Singapore, ²King Abdullah University of Science and Technology, Saudi Arabia

143-We (1378)

A SINGLE-WALLED CARBON NANOTUBES BETAVOLTAIC MICROCELL

Yiyang Chang, Changchuan Chen, Jinwen Zhang

Peking University, China

144-Th (1390)

STUDY OF THE WIDEBAND BEHAVIOR OF AN IN-PLANE ELECTROMAGNETIC MEME ENERGY HARVESTER

Huicong Liu, You Qian, Nan Wang, Chengkuo Lee

National University of Singapore, Singapore

145-Mo (1391)

LEAD-FREE (K,Na)NbO₃ BASED IMPACT TYPE ENERGY HARVESTERS INTEGRATED WITH A CYLINDRICAL CAVITY FOR METAL BALL

Minh Le Van, Motoaki Hara, Hiroyuki Oguchi, Hiroki Kuwano

Tohoku University, Japan

146-Tu (1393)

HIGH Q AND LOW RESONANT FREQUENCY MICRO ELECTRET ENERGY HARVESTER FOR HARVESTING LOW AMPLITUDE HARMONICS OF VIBRATION

Shuwei Liu, Jianmin Miao, Sun Woh Lye

Nanyang Technological University, Singapore

147-We (1401)

PIEZOELECTRIC RUBBER FILMS FOR HUMAN PHYSIOLOGICAL MONITORING AND ENERGY HARVESTING

Jih-Jhe Wang, Jui-Wei Tsai, Yu-Chuan Su
National Tsing Hua University, Taiwan

148-Th (1417)

HEAT ENERGY MANAGEMENT SCHEME OF THERMOELECTRIC GENERATOR USING PHASE CHANGE MATERIAL

Sung-Eun Jo, Myoung-Soo Kim, Yong-Jun Kim
Yonsei University, Korea

150-Tu (1478)

STACKED FLEXIBLE PARALENE-BASED 3D INDUCTORS WITH NI80FE20 CORE FOR WIRELESS POWER TRANSMISSION SYSTEM

Xuming Sun¹, Yang Zheng¹, Zhongliang Li¹, Xiuhan Li², Haixia Zhang¹
¹National Key Laboratory of Science and Technology on Micro/Nano Fabrication, Peking University, China, ²Beijing Jiaotong University, China

151-We (1520)

A PACKAGED ELECTROSTATIC ENERGY HARVESTER WITH MICRO-MOLDED BULK ELECTRETS

Ling Bu, Xiaoming Wu, Xiaohong Wang, Litian Liu
Tsinghua University, China

152-Th (1547)

HIGH POWER LITHIUM ION MICROBATTERIES WITH LITHOGRAPHICALLY DEFINED 3-D POROUS ELECTRODES

James H. Pikul, Hui Gang Zhang, Jiung Cho, Paul V. Braun, William P. King
University of Illinois at Urbana-Champaign, USA

153-Mo (1567)

MULTIBAND VIBRATION ENERGY HARVESTER BASED ON FREQUENCY-UP CONVERSION THROUGH A BISTABLE MULTIPLE-MASS SYSTEM WITH BUCKLED BEAMS

Francesco Cottone¹, Philippe Basset¹, Raphael Guillemet¹, Dimitri Galayko², Frederic Marty¹, Tarik Bourouina¹
¹Université Paris-Est, France, ²UPMC-Sorbonne Universités, France

154-Tu (1641)

ALL-POLYMER SOFT-X-RAY-CHARGED PIEZOELECTRET WITH EMBEDDED PEDOT ELECTRODE

Yue Feng, Yuji Suzuki
The University of Tokyo, Japan

155-We (1701)

A MICRO-SCALE MICROBIAL FUEL CELL (MFC) HAVING ULTRAMICROELECTRODE (UME) ANODE

Hao Ren¹, Sriram Rangaswami², Hynng-Sool Lee³, Junseok Chae¹
¹Arizona State University, USA, ²Corona del Sol High School, USA, ³ University of Waterloo, Canada

156-Th (1703)

MONOLITHICALLY-FABRICATED LAMINATED INDUCTORS WITH ELECTRODEPOSITED SILVER WINDINGS

Minsoo Kim, Florian Herrault, Jooncheol Kim, Mark G. Allen
Georgia Institute of Technology, USA

157-Mo (1727)

APPLICATION OF PRAIELECTRIC TO A MINIATURE CAPACITIVE ENERGY HARVESTER REALIZING SEVERAL TENS MICRO WATT -RELATIONSHIP BETWEEN POLARIZATION HYSTERESIS AND OUTPUT POWER-

Tomokazu Takahashi¹, Masato Suzuki¹, Toshio Nishida², Yasuhiro Yoshikawa², Seiji Aoyagi¹

¹Kansai University, Japan, ²ROHM Co., Ltd., Japan

158-Tu (1775)

STACKABLE COW DUNG BASED MICROFABRICATED MICROBIAL FUEL CELLS

Vishnu Jayaprakash Vishnu Jayaprakash, Ryan D. Sochol, Roseanne Warren, Alina Kozinda, Kosuke Iwai, Liwei Lin
University of California - Berkeley, USA

159-We (1807)

DESIGN AND FABRICATION OF FUEL-SELF-PROPELLED REACTION DEVICE FOR PASSIVE MICRO DIRECT METHANOL FUEL CELL ANODES

Yi-Shiuan Wu¹, Chung-Nan Wang¹, I-Chi Fang¹, Fan-Gang Tseng¹, Fan-Gang Tseng²
¹National Tsing Hua University, Taiwan, ²Academia Sinica, Taiwan

Bio MEMS

160-Th (1008)

A FLEXIBLE IMPLANTABLE MICRO TEMPERATURE SENSOR ON POLYMER CAPILLARY FOR BIOMEDICAL APPLICATIONS

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161-Mo (1072)

CELL MEMBRANE FIBERS FOR THE PLATFORM OF TRANSMEMBRANE PROTEIN ANALYSIS

Koji Sato, Shoji Takeuchi
The University of Tokyo, Japan

162-Tu (1128)

FABRICATION OF MICRO PORE ARRAYS IN FREE STANDING COC MEMBRANES AND IT'S APPLICATION FOR ON-CHIP MODEL OF BONE MARROW MICRO VASCULAR NICHE

Murat Gel¹, Sasikaran Kandasamy², Kellie Cartledge¹, David Haylock¹
¹CSIRO, Material Science and Engineering, Australia, ²Melbourne Center for Nanofabrication, Australia

163-We (1137)

HIGH SENSITIVITY DNA SIEVING TECHNOLOGY BY ENTROPIC TRAPPING IN 3D ARTIFICIAL NANO-CHANNEL MATRICES

Chung-Hsuan Wang¹, Cho-Lun Hsu¹, Wen-Cheng Chiu¹, Tung-Yen Lai¹, Tong-Huan Chou¹, Ivy Yang¹, ChiaHua Ho¹, Chenming Hu³, Fu-Liang Yang¹
Y. C. Chou²

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164-Th (1164)

AN INTEGRATED MICROFLUIDIC SYSTEM FOR DETECTING HUMAN IMMUNODEFICIENCY VIRUS IN BLOOD SAMPLES

Wen-Hsin Chang¹, Jung-Hao Wang¹, Wei-Shuo Ling², Lie Cheng², Chih-Hung Wang¹, Shainn-Wei Wang², Gwo-Bin Lee¹
¹National Tsing Hua University, Taiwan, ²National Cheng Kung University, Taiwan

165-Mo (1202)

DIFFERENT OPTICAL IMAGES FOR OPTICAL-INDUCED ELECTROPORATION OF MULTIPLE GENE TRANSFECTION

You-Hsun Lee, Chih-Hung Wang, Gwo-Bin Lee
National Tsing Hua University, Taiwan

166-Tu (1266)

SINGLE CELL ENZYME DIAGNOSIS ON THE CHIP

Charlotte Harmsen¹, Maria Juul Nielsen¹, Sissel Juul², Magnus Stougaard¹, Kam W. Leong², Birgitta Ruth Knudsen¹, Yi-Ping Ho³

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167-We (1269)

FABRICATION OF 3D MICROFLUIDIC NETWORKS WITH A HYBRID STAMP

Yu-Chun Kung¹, Kuo-Wei Huang¹, Yajia Yang¹, Yu-Jui Fan², Pei-Yu Chiou¹

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168-Th (1405)

STRONG SERS BIOSENSOR WITH GOLD NANOSTRUCTURE SANDWICHED ON GRAPHENE

Hung-yao Chu, Judy M. Obliosca, Pen-Cheng Wang, Fan-Gang Tseng

National Tsing Hua University of Hsinchu, Taiwan

169-Mo (1348)

A HIGH DENSITY MONOLAYER CELLS SELF-ASSEMBLY CHIP FOR HIGH-THROUGHPUT RARE CELLS DETECTION

Tsung-Ju Chen¹, Jui-Chia Chang¹, Yu-Cheng Chang¹, Fan-Gang Tseng¹

¹National Tsing Hua University, Taiwan, ²Academia Sinica, Taiwan

170-Tu (1421)

A PIEZORESISTIVE CELLULAR TRACTION FORCE SENSOR

Uijin Jung, Hidetoshi Takahashi, Tetsuo Kan, Kiyoshi Matsumoto, Isao Shimoyama

The University of Tokyo, Japan

171-We (1457)

COMBINATORIAL DIFFERENTIATION INDUCTION OF EMBRYONIC BODIES IN "PASCL (PNEUMATICALLY ACTUATED SPHEROIDS CULTURE LAB-ON-CHIP)"

Akane Yasukawa, Takuya Nishijima, Masashi Ikeuchi, Koji Ikuta

University of Tokyo, Japan

172-Th (1499)

VESICLES IN A VESICLE:FORMATION OF A CELL-SIZED VESICLE CONTAINING SMALL VESICLES FROM TWO PLANAR LIPID BILAYERS USING PULSED JET FLOW

Koki Kamiya¹, Ryuji Kawano¹, Toshihisa Osaki¹, Shoji Takeuchi²

¹Kanagawa Academy of Science and Technology, Japan, ²Institute of Industrial Science, The University of Tokyo, Japan

173-Mo (1580)

INCREASED PROLIFERATION OF PRIMARY CHONDROCYTE CELLS BY NANOSTRUCTURE AND CYCLING MECHANICAL STIMULATION ON PDMS CELL CHIP

Tsung-Ju Chen¹, Yu-Ling Wang¹, Tung-Yi Lin¹, Fan-Gang Tseng¹, Fan-Gang Tseng²

¹National Tsing Hua University, Taiwan, ²Academia Sinica, Taiwan

174-Tu (1597)

CELL DETECTION USING A CMOS IMAGE SENSOR WITH MODIFIED PIXEL STRUCTURE SUITABLE FOR BIO-CHEMICAL SURFACE ACTIVATION

Javid Musayev, Yekbun Adigüzel, Haluk Külah, Selim Eminoğlu, Tayfun Akin

Middle East Technical University, Turkey

175-We (1630)

AN ELASTOMERIC POLYMER MICROCHIP FOR MECHANICALLY TUNABLE CELL TRAPPING

Jing Zhu, Junyi Shang, David Brenner, Qiao Lin

Columbia University, USA

176-Th (1658)**MECHANICAL PUMPLESS GIANT LIPOSOME TRAPPING SYSTEM USING A PALLYRENE MICRO FILTER FOR BIOLOGICAL ASSAY**

Yuta Abe¹, Koki Kamiya¹, Toshihisa Osaki¹, Ryuji Kawano¹, Norihisa Miki³, Shoji Takeuchi²

¹Kanagawa Academy of Science and Technology, Japan, ²Institute of Industrial Science, The University of Tokyo, Japan, ³Keio University, Japan

177-Mo (1724)**MICROFLUIDIC DEVICE WITH CARBON NANOTUBE CHANNEL WALLS FOR BLOOD PLASMA EXTRACTION**

Yin-Ting Yeh, Nestor Perea-Lopez, Archi Dasgupta, Ramedane Haruoaka, Mauricio Terrones, Si-Yang Zheng

The Pennsylvania State University, USA

179-We (1763)**IMPEDANCE BIOSENSOR BASED ON INTERDIGITATED ELECTRODE ARRAYS FOR DETECTION OF LOW LEVELS OF E.COLI O157:H7.**

Shibajyoti Ghosh Dastider¹, Syed Barizuddin², Majed Dweik², Mahmoud Almasri¹

¹University of Missouri, USA, ²Lincoln University, USA

180-Th (1790)**DISSOLVABLE MOBILE MICROPLATES FOR HANDLING ADHERENT CELLS**

Shotaro Yoshida, Shoji Takeuchi

Institute of Industrial Science, The University of Tokyo, Japan

181-Mo (1797)**NANOIMPRINTED HOLES TO IMMOBILIZE MICROBES**

Tomonori Kano, Tomomi Inaba, Norihisa Miki

Keio University, Japan

Chemical Sensors and Systems**182-Tu (1009)****INTEGRATED MICRO WOBBE INDEX METER ENABLING ON-CHIP ENERGY CONTENT MEASUREMENT**

Joost C. Lotters¹, Theo S.J. Lammerink², Marco G. Pap², Remco G.P. Sanders², Meint J. de Boer², Albert J. Mouris³, Remco J. Wiegerink²

¹Bronkhorst High-Tech BV, Netherlands, ²MESA+ Research Institute, University of Twente, Netherlands, ³Hobre Instruments BV, Netherlands

183-We (1126)**A GRAPHENE FET GAS SENSOR GATED BY IONIC LIQUID**

Akira Inaba, Kwanghyun Yoo, Yusuke Takei, Kiyoshi Matsumoto, Isao Shimoyama

The University of Tokyo, Japan

184-Th (1185)**A 3D METALLIC STRUCTURE ARRAY FOR REFRACTIVE INDEX SENSING WITH OPTICAL VORTEX**

Etsuo Maeda¹, Yaerim Lee¹, Youjiro Kobayashi¹, Ya-Lun Ho¹, Shigenori Fujikawa², Jean-Jacques Delaunay¹

¹The University of Tokyo, Japan, ²Kyushu University, Japan

185-Mo (1222)**A NOVEL GAS SENSOR USING POLYMER DISPERSED LIQUID CRYSTAL DOPED WITH CARBON NANOTUBES**

Yu-Tse Lai, Yao-Joe Yang

National Taiwan University, Taiwan

186-Tu (1254)

MEMS LC MICROCHIP WITH LOW DISPERSION AND LOW PRESSURE DROP TURN STRUCTURE USING DISTRIBUTION CONTROLLED MICRO PILLAR ARRAY

Katsuya Takatsuki¹, Muneki Isokawa², Yanting Song², Asahi Nakahara¹, DongHyun Yoon¹, Tetsushi Sekiguchi¹, Jun Mizuno¹, Takashi Funatsu², Makoto Tsunoda²
Shuichi Shoji¹

¹Waseda University, Japan, ²University of Tokyo, Japan

187-We (1312)

DEVELOPMENT OF MWCNT EMBEDDED MICROMECHANICAL RESONATOR WORKING AS RAREFIED GAS SENSOR

Hiroyuki Kishihara¹, Itsuo Hanasaki², Naoki Matsuduka³, Ichiro Yamashita⁴, Yukiharu Uraoka⁴, Yoshitada Isono¹

¹Kobe University, Japan, ²Osaka University, Japan, ³Akashi National College of Technology, Japan, ⁴Nara Institute of Science and Technology, Japan

188-Th (1433)

RESONANT CANTILEVERS WITH NANOPARTICLES-SPACED FUNCTIONAL GRAPHENE-OXIDE SHEETS FOR HIGH-PERFORMANCE SENSING TO PPT-LEVEL EXPLOSIVE VAPOR

Pengcheng Xu, Haitao Yu, Xiaoyuan Xia, Feng Yu, Min Liu, Xinxin Li

¹Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China

189-Mo (1475)

NANO-FRACTAL GAS SENSOR INTEGRATED ON MICRO HEATER FABRICATED WITH SUSPENSION COATING

Minoru Abasaki¹, Shin-ich Souma², Nobuyuki Moronuki³, Masakazu Sugiyama⁴

¹BEANS Project, Japan, ²Fuji Electric, Co., Ltd, Japan, ³Tokyo Metropolitan University, Japan, ⁴The University of Tokyo, Japan

190-Tu (1527)

HIGH-SENSITIVITY MICRO-GAS CHROMATOGRAPHY USING STOCHASTIC INJECTION TECHNIQUES

William Cesar¹, Frédéric Flourens¹, Claire Kaiser², Christophe Sutour², Dan E. Angelescu¹

¹ESIEE/ESYCOM Lab., Université Paris Est, France, ²Laboratoire National de Métrologie et d'Essais, France

191-We (1619)

A PPB-LEVEL, MINIATURIZED FAST RESPONSE AMPEROMETRIC NITRIC OXIDE SENSOR FOR ASTHMA DIAGNOSIS

Hithesh K Gatty, Simon Leijonmarck, Mikael Antelius, Göran Stemme, Niclas Roxhed
KTH Royal Institute of Technology, Sweden

192-Th (1651)

LOGIC GATE USING ARTIFICIAL CELL-MEMBRANE : NAND OPERATION BY TRANSMEMBRANE DNA VIA A BIOLOGICAL NANOPORE

Hiroki Yasuga¹, Ryuji Kawano¹, Masahiro Takinoue⁴, Yutaro Tsuji¹, Toshihisa Osaki¹, Koki Kamiya¹, Norihisa Miki³, Shoji Takeuchi²

¹Kanagawa Academy of Science and Technology(KAST), Japan, ²The University of Tokyo, Japan, ³Keio University, Japan, ⁴Tokyo Institute of Technology, Japan

193-Mo (1671)

ELECTROKINETICALLY INTEGRATED MICROFLUIDIC ISOLATION AND AMPLIFICATION OF BIOMOLECULE- AND CELL-BINDING NUCLEIC ACIDS

Jinho Kim, John P. Hilton, Kyung-Ae Yang, Renjun Pei, Jing Zhu, Milan Stojanovic, Qiao Lin
Columbia University, USA

194-Tu (1794)

HIGH-SENSITIVITY ELECTROCHEMICAL SENSOR USING PYROLYZED POLYMER-GOLD

3D PROBE ARRAYS FOR SPATIAL CHEMICAL SENSING

Wataru TONOMURA, Yuki MORI, Satoshi KONISHI
Ritsumeikan University, Japan

195-We (1771)

HORIZONTAL LIPID BILAYERS FORMED BY DROPLETS CONTACT METHOD ON PATTERNED MICRO-DROPLETS

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Medical Microsystems

196-Th (1017)

INTEGRATED MULTI-LED ARRAY WITH THREE-DIMENSIONAL POLYMER WAVEGUIDE FOR OPTOGENETICS

Ki Yong Kwon, Wen Li

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197-Mo (1044)

ULTRATHIN, DUAL-SIDED SILICON MICROPROBES REALIZED USING BCB BONDING AND ALUMINUM SACRIFICIAL ETCHING

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198-Tu (1113)

CELL FATIGUE TEST

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199-We (1116)

ULTRACOMPACT OPTRODE WITH INTEGRATED LASER DIODE CHIPS AND SU-8 WAVEGUIDES FOR OPTOGENETIC APPLICATIONS

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200-Th (1118)

REGIONAL 3-AXIS PLANTAR FORCES DURING STAIR ASCENT

Masataka Hori, Hidetoshi Takahashi, Akihito Nakai, Kiyoshi Matsumoto, Isao Shimoyama
University of Tokyo, Japan

201-Mo (1170)

INTEGRATION OF CATHETER SENSOR ONTO TRACHEAL INTUBATION TUBE SYSTEM

Kazuhiro Yoshikawa, Yudai Yamazaki, Takuya Matsuyama, Mitsuhiro Shikida, Miyoko Matsushima, Tsutomu Kawabe

Nagoya University, Japan

202-Tu (1203)

SPIRA MIRABILIS ENHANCED DENSITY GRADIENT SEDIMENTATION

Sinéad M Kearney, David J Kinahan, Jens Ducreé

Dublin City University, Ireland

203-We (1234)

A 512-CHANNEL EPIRETINAL IMPLANT

Han-Chieh Chang, Yang Liu, Dongyang Kang, Yu Zhao, Chia-Chen Yu, Manuel Monge, Azita Emami, Yu-Chong Tai

California Institute of Technology, USA

204-Th (1284)

MULTI-MATERIAL PAPER DISC DEVICES FOR LOW COST BIOMEDICAL DIAGNOSTICS

Elizaveta Vereshchagina, Ken Bourke, Lorraine Meehan, Chandra Dixit, Declan Mc Glade, Jens Ducree

Biomedical Diagnostics Institute / Dublin City University, Ireland

205-Mo (1285)

A SAMPLE-TO-ANSWER POLYMER LAB-ON-A-CHIP FOR POINT-OF-CARE TESTING OF THYROID STIMULATING HORMONE (TSH) IMMUNOASSAY

Wooseok Jung¹, Jungyoup (Jay) Han², Junhai Kai², Ji-Youn Lim³, Donggeun Sul³, Chong H. Ahn¹

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206-Tu (1362)

2-DIMENSIONAL NEAR-FIELD MILLIMETER-WAVE SCANNING WITH MICROMACHINED PROBE FOR SKIN CANCER DIAGNOSIS

Fritzi Töpfer, Sergey Dudorov, Joachim Oberhammer

KTH Royal Institute of Technology, Sweden

207-We (1376)

ALL-IN-ONE SURFACE ENERGY TRAP ENABLED DROPLET PLATFORM FOR MULTIPLEXED GENETIC DETECTION IN BLOOD

Yi Zhang, Tza-Huei Wang

Johns Hopkins University, USA

208-Th (1443)

ENDOSCOPIC OPTICAL PROBES FOR LINEAR AND ROTATIONAL SCANNING

Niklas Weber, Hans Zappe, Andreas Seifert

University of Freiburg, Germany

209-Mo (1550)

CONFORMALLY INTEGRATED STENT CELL RESONATORS FOR WIRELESS MONITORING OF PERIPHERAL ARTERY DISEASE

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210-Tu (1577)

3D PARYLENE SHEATH PROBES FOR RELIABLE, LONG-TERM NEUROPROSTHETIC RECORDINGS

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211-We (1621)

LOW-POWER, SELF-CONTAINED, RECIPROCATING MICROPUMP THROUGH ELECTROLYSIS AND CATALYST-DRIVEN RECOMBINATION TOWARD DRUG DELIVERY APPLICATIONS

Jose M. Portilla, Unyoung Kim

Santa Clara University, USA

212-Th (1636)

ALL-IN-ONE MICROFLUIDIC DEVICE FOR MICROVASCULAR CONNECTION

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213-Mo (1672)

CONFOCAL MICROENDOSCOPIC 3D IMAGING USING MEMS SCANNERS FOR BOTH LATERAL AND AXIAL SCANS

Lin Liu, Erkang Wang, Xiaoyang Zhang, Yiqi Tang, Wenjun Liao, Huikai Xie
University of Florida, USA

214-Tu (1693)

A PORTABLE CONTINUOUS GLUCOSE MONITORING DEVICE FOR AN IMPLANTABLE FLUORESCENT HYDROGEL MICROFIBER

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215-We (1718)

ANTERIOR AND POSTERIOR TONGUE ACTIVITY SENSOR BASED ON TRIAXIAL FORCE SENSOR

Yusuke Takei¹, Kentaro Noda¹, Toshihiko Kawai², Takashi Tachimura³, Yoshio Toyama⁴, Megumi Takai⁴, Kiyoshi Matsumoto¹, Isao Shimoyama¹
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216-Th (1787)

METAL/SILICON DIOXIDE MICROTUBE IMPROBES OPTICAL AND ELECTRICAL PROPERTIES OF NEUROPROBE

Tomohiko Nakamura, Masahiro Sakata, Akihiro Goryu, Makoto Ishida, Takeshi Kawano
¹Toyohashi University of Technology, Japan

217-Mo (1830)

MINIATURE X-RAY IMAGING BASED ON SAFELY SHIELDED PURE BETA RADIOISOTOPES

Mahatasin Azad, Dong-Ok Choe, Hanseup Kim
University of Utah, USA

Micro-Fluidic Components and Systems

219-We (1060)

RAPID MEASUREMENT OF SPECIFIC MEMBRANE CAPACITANCE AND CYTOPLASM CONDUCTIVITY ON SINGLE CELLS

Yi Zheng¹, Ehsan Shojaei-Baghini¹, Chen Wang², Yu Sun¹
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220-Th (1064)

INVESTIGATION ON THE THICKNESS EFFECT OF A HYDROPHOBIC LAYER FOR OPERATING VOLTAGE REDUCTION IN EWOD SYSTEMS

Jeong Byung Chae, Jun O Kwon, Ji Sun Yang, Sang Kug Chung
Myongji University, Korea

221-Mo (1095)

INTERFACIAL MICROFLUIDIC TRANSPORT ON MICROPATTERNED SUPERHYDROPHOBIC TEXTILE

Siyuan Xing, Jia Jiang, Tingrui Pan
University of California, Davis, USA

222-Tu (1123)

PATTERNING OF MICRO-DROPLETS IN NONPOLAR SOLVENT BY ELECTRO-EMULSIFICATION AND ELECTROPHORESIS

Toru Nakakubo, Kiyoshi Matsumoto, Isao Shimoyama
The University of Tokyo, Japan

223-We (1139)

A PARTICLE TRAPPING CHIP USING THE WIDE AND UNIFORM SLIT FORMED BY A DEFORMABLE MEMBRANE AND AIR BUBBLE PLUGS

IL DOH, YOONJI KIM, YOUNG-HO CHO
Korea Advanced Institute of Science and Technology (KAIST), Korea

224-Th (1155)

OSMOTIC ACTUATION FOR MICROFLUIDIC COMPONENTS IN POINT-OF-CARE APPLICATIONS

Yu-Chih Chen, Patrick Ingram, Xia Lou, Euisik Yoon
University of Michigan, USA

225-Mo (1228)

A DIGITAL MICROFLUIDIC CONTROL SYSTEM WITH PRECISE CONTROL OF ELECTROSTATIC FORCE AND IMPEDANCE-BASED VELOCITY MEASUREMENT

Ryan Fobel, Aaron Wheeler
University of Toronto, Canada

226-Tu (1251)

MULTI-COLOR MICROFLUIDIC ORGANIC LIGHT EMITTING DEVICE USING ELECTROLUMINESCENCE AND ELECTROCHEMILUMINESCENCE

Takashi Kasahara¹, Jun Mizuno¹, Shigeyuki Matsunami², Tomohiko Edura², Miho Tsuwaki¹, Juro Oshima², Chihaya Adachi², Shuichi Shoji¹

¹Waseda University, Japan, ²Kyushu University, Japan

227-We (1289)

DYNAMIC STRESSING MEASUREMENT OF VISCOUS LIQUID USING MICROFLUIDIC CHIP

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228-Th (1343)

INTEGRATION OF MICROFLUIDIC DEVICES AND AN OPTICALLY-INDUCED DIELECTROPHORESIS DEVICE FOR MEDIUM REPLACEMENT AND CELL MANIPULATION/SEPARATION

Huan-Chun Wu, Gwo-Bin Lee
National Tsing Hua University, Taiwan

229-Mo (1345)

GENERATION OF PREPENDICULAR CHEMICAL AND OXYGEN GRADIENTS FOR CELL CULTURE IN A MICROFLUIDIC DEVICE

Melissa Tu¹, Yung-Ju Cheng², Ying-Hua Chen², Chien-Chung Peng²

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230-Tu (1382)

FLIP-DROP: DROPLET ARRAY CREATED BY SURFACE ENERGY TRAP

Yi Zhang, Tza-Huei Wang
Johns Hopkins University, USA

231-We (1407)

HIGH-THROUGHPUT SPERM SORTING IN A MICRO DIFFUSER TYPE FLUIDIC SYSTEM

Yu-Nan Lin, Peng-Chun Chen, Ren-Guei Wu, Li-Chern Pan, Fan-Gang Tseng
National Tsing Hua University, Taiwan

232-Th (1424)

A NOVEL DRUG DELIVERY METHOD BY USING A MICROROBOT INCORPORATED WITH AN ACOUSTICALLY OSCILLATING BUBBLE

Jun O Kwon, Ji Sun Yang, Jeong Byung Chae, Sang Kug Chung
Myongji University, Korea

233-Mo (1438)

ATTOLITER DROPLET FORMATION USING NANOCHANNEL AND ENZYME REACTION

INSIDE A DROPLET

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234-Tu (1449)

MULTI NOZZLE ELECTROHYDRODYNAMIC INKJET PRINTING HEAD BY BATCH FABRICATION

Kyoung Il Lee¹, Byunjik Lim¹, Hyunju Lee¹, Minkeun Kim¹, Seong Hyun Kim¹, Churl Seung Lee¹, Jin Woo Cho¹, Seungjun Chung², Yongtaek Hong²

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235-We (1450)

CONTACTLESS CATCH-AND-RELEASE SYSTEM FOR GIANT LIPOSOMES BASED ON NEGATIVE DIELECTROPHORESIS

Taiga Kodama², Toshihisa Osaki¹, Ryuji Kawano¹, Koki Kamiya¹, Norihisa Miki², Shoji Takeuchi³

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236-Th (1466)

ENZYME-DOPED ION SELECTIVE MEMBRANE (ED-ISM) FORMED WITH SURFACE FORCE AND MICROSTRUCTURES FOR HIGH PERFORMANCE UREA DETECTION

Ting-Yi Chiang, Che-Hsin Lin

University of National Sun Yat-sen, Taiwan

237-Mo (1542)

SHEATH-FLOW FORMING BY USING TWISTED MICRO-CHANNEL

Tomomi Sato, Ryo Miyake

Hiroshima University, Japan

238-Tu (1555)

LARGE RANGE VERSATILE WIRELESS MICROROBOTIC MANIPULATORS IN MICROFLUIDIC DEVICES

Gilgueng Hwang¹, Hugo Salmon¹, Ioan A. Ivan², Joel Agnus², Nicolas Chaillet², Stephane Regnier³, Anne-Marie Haghiri-Gosnet¹

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239-We (1588)

TURBULENT DRAG REDUCTION ON SUPERHYDROPHOBIC SURFACES CONFIRMED BY BUILT-IN SHEAR SENSING

Hyungmin Park, Guangyi Sun, Chang-Jin "CJ" Kim

University of California, Los Angeles, USA

240-Th (1675)

MINIATURIZED PUMPS AND VALVES, BASED ON CONDUCTIVE POLIMER ACTUATORS, FOR LAB-ON-CHIP APPLICATION

Maki Hiraoka¹, Paolo Fiorini², Bjorn Vandecasteele³, Hiroyuki Tanaka¹, Tomas Podprocky³, Steven van Put³, Maaikje op De Beeck², Toshinobu Matsuno¹, Ichiro Yamashita¹

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241-Mo (1690)

HIGH-SPEED ELECTROSTATIC MICRO-HYDRAULICS FOR SENSING AND ACTUATION

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242-Tu (1750)

GRAPHENE BASED DIGITAL MICROFLUIDICS

Xuebin Tan, Peng Zeng, Wenwen Yi, Mark Ming-Cheng Cheng

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243-We (1777)

CENTRIFUGE-BASED DYNAMIC MICROARRAY SYSTEM TOWARD AN ARRAY OF A FEW AMOUNT OF SAMPLE

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244-Th (1823)

A SOLUTION EXCHANGE SYSTEM FOR MICRODROPLET REACTORS VIA CONTINUOUS FLOW MICROFLUIDIC RAILING

Kosuke Iwai, Ryan D. Sochol, Liwei Lin

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245-Mo (1825)

EFFECTIVE THREE-DIMENSIONAL (3D) SUPERHYDROPHOBIC CHANNEL COATING USING ORGANICALLY MODIFIED SILICA AEROGEL

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