MME 2010

Programme

21st Micromechanics and
Micro systems Europe Workshop

Programme

Sunday September 26 2010

18:00 – 20:00 : Registration, buffet
20:00 – 00:00 : Concert in Atak

Monday September 27 2010

8:30 – 9:00 : Registration
9:00 – 9:15 : Welcome
9:15 – 10:00 : Invited Speaker 1

Understanding and eliminating nanoscale wear
M.A. Lanz
IBM Research Division, Zurich Research Laboratory, Switzerland

10:00 – 11:00 : Flash presentation Session A (25 x 2 min)
11:00 – 12:30 : Poster Session A
12:30 – 14:15 : Lunch
14:15 – 15:00 : Invited Speaker 2

Optical sensors and actuators enabled by photonic crystals
O. Solgaard
Stanford University, E.L. Ginzton Laboratory, CA, USA

15:00 – 16:00 : Flash presentation Session B (25 x 2 min)
16:00 – 18:00 : Poster Session B

19:00 – 20:00 : Reception and Grolsch Veste tour
20:00 – 23:00 : Conference Dinner

Tuesday September 28 2010

8:30 – 9:00 : Registration
9:00 – 9:45 : Invited Speaker 3

Programmed self-assembly and dynamics of DNA nanostructures
K.V. Gothelf
Aarhus University, Denmark

9:45 - 10:45 : Flash presentation Session C (25 x 2 min)
10:45 – 12:15 : Poster Session C
12:15 – 14:00 : Lunch
14:00 – 14:45 : Invited Speaker 4

Glass-based lab-on-a-chip products
R. van 't Oever
Micronit, Enschede, The Netherlands

14:45 – 15:45 : Flash presentation Session D (25 x 2 min)
15:45 – 17:15 : Poster Session D
17:15 – 17:45 : MME2011, poster award and closing remarks

20:00 – ? : Science Cafe and excursion in Enschede

Wednesday September 29 2010

9:00 – 12:30 : MESA+ NanoLab tours

Session A
(Monday 10:00 – 12:30)

A01
Silicon carbide thin-film encapsulation of planar thermo- electric infrared (IR) detectors - for an IR microspectrometer
V. Rajaraman, G. de Graaf, P.J. French and K.A.A. Makinwa
Delft University of Technology (TU Delft), Dept. of Microelectronics, EI Lab - DIMES, The Netherlands

A02
Design, fabrication and characterization of an in-plane AFM probe with ultra-sharp silicon nitride tip
E. Sarajlic[1], J. Geerlings[2], J.W. Berenschot[2], M.H. Siekman[1,2], N.R. Tas[2] and L. Abelmann[2]
[1]SmartTip, Enschede, The Netherlands [2]MESA+ Research Institute, University of Twente, The Netherlands

A03
A silicon micromachined triaxial accelerometer using the MultiMEMS MPW process with additional deep reactive ion etching as post-processing
P. Ohlckers, L. Petricca and C. Grinde
Vestfold University College, Institute for Micro- and nano System Technologies, Norway

A04
Integrated Lab-On-A-Chip silicon nanowire biosensing platform
A. De, S. Chen, J. van Nieuwkasteele, W. Sparreboom, E.T. Carlen and A. van den Berg
BIOS Lab on a Chip Group, MESA+ Institute for Nanotechnology, University of Twente, The Netherlands

A05
Surface modification of silicon by 3D etching processes and subsequent layer deposition
Z. Fekete, D. Gubán, É. Vázsonyi, A. Pongrácz, G. Battistig and P. Fürjes
Research Institute of Technical Physics & Materials Science, Hungarian Academy of Science, Hungary

A06
Material selection for impedance spectroscopy on an eletrowetting based Lab-On-A-Chip
T. Lederer, S. Clara, B. Jakoby and W. Hilber
Institute for Microelectronics and Microsensors, Johannes Kepler University, Austria

A07

Stiction reduction in electrostatic poly-SiGe micromirrors by applying a self-assembled monolayer film

L. Fangzhou[1,2], J. De Coster[1], R. Beernaert[3], W.-Y. Lin[1,2], J.-P. Celis and J.-P. Celis

[1]IMEC, Belgium [2]Dept MTM, KU Leuven, Belgium [3]CMST, Ghent Univerity, Belgium

A08

A bridge-connected isolated silicon islands post-processing method for fine-grain-integrated 10V-operating CMOS-MEMS by standard 5V CMOS process technology

S. Morishita[1], M. Kubota[1], K. Asada[1], I. Mori[1], F. Marty[2] and Y. Mita[1]

[1]The University of Tokyo, Japan [2]ESIEE, Universit Paris Est, France

A09

Single-mask thermal displacement sensor in MEMS

B. Krijnen[1,2], R.P. Hogervorst[1], J.B.C. Engelen[3], J.W. van Dijk[1,2], D.M. Brouwer[1,2] and L. Abelmann[3]

[1]DEMCON Advanced Mechatronics, The Netherlands [2]Mechanical Automation, IMPACT, University of Twente, The Netherlands [3]Transducer Science and Technology, MESA+, University of Twente, The Netherlands

A10

AlGaN/GaN C-HEMT for piezoelectric MEMS stress sensor applications

M. Vallo[1], T. Lalinský[1], G. Vanko[1], M. Drzík[2], S. Hascik[1], I. Rýger[1] and I. Kostic[3]

[1]Institute of Electrical Engineering of the Slovak Academy of Sciences, Slovakia [2]International Laser Center, Slovakia [3]Institute of Informatics, Slovak Academy of Sciences, Slovakia

A11

A capacitive humidity sensor using a positive photosensitive polymer

N. P. Pham, V. Cherman, F.F.C. Duval, D.S. Tezcan, R. Jansen and H.A.C. Tilmans

IMEC, Belgium

A12

Silicon/glass microchip with a monolithically integrated electrospray ionization tip for mass spectrometry

L. Sainiemi[1], T. Nissilä[2,3], V. Saarela[4], R.A. Ketola[3] and S. Franssila[1]

[1]Aalto University, Department of Materials Science and Engineering, Finland [2]University of Helsinki, Division of Pharmaceutical Chemistry, Finland [3]University of Helsinki, Centre for Drug Research (CDR), Finland [4]Aalto University, Department of Micro and Nanosciences, Finland

A13

Improving the efficiency of thermoelectric generators by using solar heat concentrators

M.T. de Leon, P. Taatizadeh and M. Kraft

University of Southampton, School of Electronics and Computer Science, United Kingdom

A14

Gas sensing micromachined structure based on gallium arsenide

I. Hotovy[1], D. Tengeri[1], V. Rehacek[1], S. Hascik[2] and T. Lalinský[1]
[1]Microelectronics Department, Slovak University of Technology, Slovakia [2]Institute of Electrical Engineering, Slovak Academy of Sciences, Slovakia

A15

Structuring techniques of aluminum nitride masks for deep reactive ion etching (DRIE) of silicon

S. Leopold[1], T. Polster[1], T. Geiling[1], D. Pätz[2], F. Knöbber[4], A. Albrecht[3], O. Ambacher[4], S. Sinzinger[2] and M. Hoffmann[1]
[1]Ilmenau University of Technology, IMN MacroNano, Germany, Department for Micromechanical Systems [2]Department for Optical Engineering [3]Centre for Micro- and Nanotechnology [4]Fraunhofer Institute for Applied Solid State Physics, Germany

A16

Design and evaluation of an active cooling concept for functional ceramic circuits

T. Haas[1], C. Zeilmann[1], A. Backes[2], A. Bittner[3] and U. Schmid[3]
[1]Engineering Substrate, Micro Systems Engineering GmbH, Germany [2]Chair of Micromechanics, Microfluidics/Microactuators, Saarland University, Germany [3]Department for Microsystems Technology, Institute of Sensor and Actuator Systems, Vienna University of Technology, Austria

A17

Determination of mechanical and swelling properties of epoclad negative photoresist.

K. Wouters[1], P. Gijsenbergh[1], K. Vanstreels[2] and R. Puers[1]
[1]KULeuven, ESAT-MICAS, Belgium [2]IMEC, Belgium

A18

Graphene for nano-electro-mechanical systems

Z. Moktadir, S. Boden, H. Mizuta and H. Rutt
University of Southampton, School of Electronics and Computer Science, UK

A19

Inductive-coupling system for abdominal aortic aneurysms monitoring based on pressure sensing

A.T. Sepúlveda[1], A. Moreira[2], F. Fachin[3], B.L. Wardle[3], J.M. Silva[4], A.J. Pontes[1], J.C. Viana[1] and L.A. Rocha[1]
[1]I3N/IPC-Institute for Nanostructures, Nanomodelling and Nanofabrication, University of Minho, Portugal [2]University of Porto Faculty of Engineering, Portugal [3]Department of Aeronautics and Astronautics, Massachusetts Institute of Technology, USA [4]INESC Porto, University of Porto Faculty of Engineering, Portugal

Session B
(Monday 15:00 – 18:00)

B01
Design and modeling of a three-mass, decoupled, tunable SOI-MEMS gyroscope with sense frame architecture
I. Sabageh[1], V. Rajaraman[1], E. Cretu[2] and P. J. French[1]
[1]Delft University of Technology, Department of Microelectronics, EI Lab- DIMES, The Netherlands [2]University of British Columbia, Department of Electrical and Computer Engineering, Canada

B02
Robust MEMS for space applications
A. Delahunty and W.T. Pike
Imperial College London, UK

B03
Linear variable optical filter with silver metalic layers
A. Emadi, V.R.S.S. Mokkapati, H. Wu, G. de Graaf and R.F. Wolffenbuttel
Faculty EEMCS, Department ME/EI, Delft University of Technology, The Netherlands

B04
Fractal-based dual-band small antenna for 2.45 and 5.8 GHz
S. Ahmed[1], P. Enoksson[1], M.V. Rusu[2] and C. Rusu[3]
[1]Chalmers University of Technology, Micro and Nanosystems group, Sweden [2]Faculty of Physics, Bucharest University, Romania [3]Imego AB, Sweden

B05
Measuring thermal properties of small volumes of liquid using a robust and flexible sensor
J.J. Atherton, M.C. Rosamond, S. Johnstone and D.A. Zeze
Durham University, School of Engineering and Computing Sciences, United Kingdom

B06
Small antenna based on a MEMS magnetic field sensor that uses a piezoelectric polymer as translation mechanism
R. Lameiro[1], F.J.O. Rodrigues[1], L. Gon calves[1], S. Lanceros-Mendez[2], J.H. Correia[1] and P.M. Mendes[1]
[1]Algoritmi, UM, Campus de Azurem, Portugal [1]Center/Department of Physics, University of Minho, Portugal

B07
Fabrication of integrated bimorphs with self aligned tips for optical switching in 2-D photonic crystal waveguides
S.M. Chakkalakkal Abdulla[1], L.J. Kauppine[2], M. Dijkstra[2], M.J. de Boer[1], E. Berenschot[1], R.M. de Ridder[2] and G.J.M. Krijnen[1]
[1]Transducers Science and Technology, MESA+ Research Institute, University of Twente, The Netherlands [2]Integrated Optical Microsystems Groups, MESA+ Research Institute, University of Twente, The Netherlands

B08

High-throughput on-chip DNA fragmentation

L. Shui, M. Jin, J.G. Bomer, E.T. Carlen and A. van den Berg
BIOS/Lab-on-Chip Group, MESA+ Institute for Nanotechnology, University of Twente, The Netherlands

B09

Performance metrics for MEMS tunable capacitors

M. Hill[1], Y. Kubarappa[1] and C. O'Mahony[2]
[1]Adaptive Wireless Systems Group, Cork Institute of Technology, Ireland [2]Tyndall National Institute, University College Cork, Ireland

B10

Ultrasoft finemet thin films for magneto-impedance microsensors

J. Moulin[1], I. Shahosseini[1], F. Alves[2] and F. Mazaleyrat[3]
[1]IEF, UMR 8622, Univ Paris Sud, France [2]LGEP, UMR 8507, Supelec, France [3]SATIE, UMR 8029, ENS Cachan, France

B11

3-dimensional etching of silicon substartes using a modified deep reactive ion etching technique

S. Azimi, J. Naghsh-Nilchi, A. Amini, A. Vali, M. Mehran and S. Mohajerzadeh
School of Electrical and Computer Eng, Thin Film and NanoElectronic Lab, University of Tehran, Iran

B12

Microshutters for space physics time of flight applications

K. Brinkfeldt[1], P. Enoksson[2], B. Front[2], M. Wieser[3], M. Emanuelsson[3] and S. Barabash[3]
[1]Swerea IVF, Sweden [2]Chalmers University of Technology, Dept. Microtechnology and Nanoscience, Sweden [3]Swedish Institute of Space Physics, Sweden

B13

Study of injection molded surface features in terms of light reflection, wettability and durability

S. Kuhn, A. Burr, M. Kübler, M. Deckert and C. Bleesen
Heilbronn University, Mechatronics and Micro System Engineering, PIK, Germany

B14

Simulation studies of parametric amplification in bio-inspired flow sensors

H. Droogendijk and G.J.M. Krijnen
University of Twente, MESA+ Research Institute, The Netherlands

B15

Adsorption studies of DNA origami on silicon dioxide

B. Albrecht[1,2], D.S. Hautzinger[1,3,4], M. Krüger[2], M. Elwenspoek[4,5], K.M. Müller[3,5] and J.G. Korvink[1,4]
[1]Laboratory for Simulation, Dep. of Microsystems Engineering (IMTEK), [2]Laboratory for Sensors, Dep. of Microsystems Engineering (IMTEK), [3]Laboratory for Synthetic Biosystems, Institute of Biology III, [4]FRIAS, 5Centre for Biological Signaling Studies (bioss), [1−−5]University of Freiburg, Germany

B16

3D lithography based fabrication of neural stimulator electrode arrays

F. Ceyssens[1], J. Verstraete[1], B. Volckaerts[2] and R. Puers[1]
[1]KULeuven dept. ESAT-MICAS, Belgium. [2]Cochlear Technology Center, Belgium.

B17

A micro fuel cell stack without interconnect overhead - macro world-like stacks in MEMS

G. Scotti[1,3], P. Kanninen[2], T. Kallio[2] and S. Franssila[3]
[1]Department of Micro and Nanosciences, Aalto University School of Science and Technology, Finland [2]Department of Chemistry, Aalto University School of Science and Technology, Finland [3]Department of Materials Science and Engineering, Aalto University School of Science and Technology, Finland

B18

Fabrication technique of a compressible biocompatible interconnect using a thin film transfer process

A.A.A. Aarts[1,2,3], O. Srivannavit[3], K.D. Wise[3], E. Yoon[3], H.P. Neves[1], R. Puers[1,2] and C. van Hoof[1,2]
[1]Technology Unit, IMEC, Belgium [2]ESAT-Micas, KU Leuven, Belgium [3]EECS, University of Michigan, USA

B19

Interference filter based absorber for thermopile detector array by surface micromachining

H. Wu, A. Emadi, G. de Graaf and R. Wolffenbuttel
Delft University of Technology, Faculty of EEMCS, Department of ME/EI, The Netherlands

B20

Thermal analysis, fabrication and signal processing of surface micromachined thermal conductivity based gas sensors

G. de Graaf, H. Wu and R.F. Wolffenbuttel
Delft University of Technology, Faculty EEMCS, Dept. for Micro-Electronics, The Netherlands

Session C
(Tuesday 9:45 – 12:15)

C01
High aspect ratio hidrogenation-assisted lateral etching of (100) silicon
M. Kayyalha, J. Naghsh Nilchi, A. Ebrahimi and S. Mohajerzadeh
University of Tehran, Nano-Electronics and Thin Film Lab., Iran

C02
AFM-based mechanical characterization of fbar cantilevers as first step towards developing of force sensors
C.J. Camargo, H. Campanella, J. Montserrat and J. Esteve
Instituto de Microelectrónica de Barcelona IMB-CNM (CSIC), Spain

C03
Post-processing of linear variable optical filter on CMOS chip at die-level
A. Emadi, H. Wu, G. de Graaf and R. F. Wolffenbuttel
Faculty EEMCS, Department ME/EI, Delft University of Technology, The Netherlands

C04
MEMS based gravimeters and gravity gradiometers
R. Cuperus[1], F.F. Flokstra[1], R.J. Wiegerink[2] and J. Flokstra[1]
[1]University of Twente, Interfaces and Correlated Electron systems, The Netherlands
[2]University of Twente, Transducers Science and Technology, The Netherlands

C05
A musical instrument in MEMS
J.B.C. Engelen, H. de Boer, J.G. Beekman, A.J. BeenG.A. Folkertsma, L. Fortgens, D. de Graaf, S. Vocke, L.A. Woldering and L. Abelmann
Transducer Science and Technology, MESA+ Institute for Nanotechnology, University of Twente, Enschede, The Netherlands

C06
Microfluidic chip development for an autonomous field deployable water quality analyser
D. Maher[1], J. Healy[1], J. Cleary[1], G. Carroll[2] and D. Diamond[1]
[1]CLARITY: Centre for Web Sensing Technologies, Dublin City University, Ireland
[2]EpiSensor Ltd., Ireland

C07
A novel multisite silicon probe for laminar neural recordings with improved electrode impedance
A. Pongrácz[1], G. Márton[1], L. Grand[2,3], É. Vázsonyi[1], I. Ulbert[2,3], G. Karmos[2,3], S. Wiebe[4] and G. Battistig[1]
[1]Research Institute for Technical Physics and Materials Science, Hungarian Academy of Sciences, Hungary [2]Peter Pazmany Catholic University, Faculty of Information Technology, Hungary [3]Institute for Psychology of the Hungarian Academy of Sciences, Hungary [4]Plexon Inc., USA

C08

Large deflection actuator for variable-ratio RF MEMS power divider application

Y. Li[1], S. Kühne[1], D. Psychogiou[2], J. Hesselbarth[2] and C. Hierold[1]

[1]Micro- and Nanosystems, Department of Mechanical and Process Engineering, ETH Zurich, Switzerland [2]Laboratory for Electromagnetic Fields and Microwave Electronics, Department of Information Technology and Electrical Engineering, ETH Zurich, Switzerland

C09

PVDF micro heat exchanger manufactured by ultrasonic hot embossing and welding

K. Burlage, C. Gerhardy and W.K. Schomburg

RWTH Aachen University, Konstruktion und Entwicklung von Mikrosystemen (KEmikro), Germany

C10

A comb based in-plane SiGe capacitive accelerometer for above-IC integration

L. Wen[1], K. Wouters[1], L. Haspeslagh[2], A. Witvrouw[2] and R. Puers[1]

[1]ESAT-MICAS, Katholieke Universiteit Leuven, Belgium [2]IMEC, Belgium

C11

Surface-micromached gas sensor using thermopiles for carbon dioxide detection

S. Chen, H. Wu, G. de Graaf and R. F. Wolffenbuttel

Delft University of Technology, Faculty of EEMCS, Department of ME/EI, The Netherlands

C12

Subwavelength nanopyramids for surface enhanced Raman scattering

M. Jin[1], V. Pully[2], C. Otto[2], A. van den Berg[1] and E.T. Carlen[1]

[1]BIOS/Lab-on-a-Chip Group, [2]Medical Cell Biophysics Group [1,2]MESA+ Institute for Nanotechnology, [2]MIRA Institute for Biomedical Technology and Technical Medicine, University of Twente, The Netherlands

C13

A microneedle-based miniature syringe for transdermal drug delivery

C. O'Mahony, J. Scully, A. Blake and J. O'Brien

Tyndall National Institute, University College Cork, Ireland

C14

On the processing aspects of high performance hybrid backside illuminated CMOS imagers

J. De Vos, K. De Munck, K. Minoglou, P. Ramachandra Rao, M.A. Erismis, P. De Moor and D.S. Tezcan

IMEC, Belgium

C15

Fabrication and characterization of carbon nanotube composites for strain sensor applications

F. Ceyssens[1], M. De Volder[2], G. Keulemans[1], J.W. Seo[3] and R. Puers[1]
[1]KULeuven, dept. ESAT-MICAS, Belgium. [2]KULeuven, dept. Mech. 2Eng, Belgium [3]KULeuven, dept. MTM, Belgium

C16

Fluidic variable inductor using SU8 channel

I. El Gmati[1,3], P. Calmon[1,2], R. Fulcran[1], S. Pinon[1], A. Boukabache[1,2], P. Pons[1,2] and A. Kallala[3]
[1]LAAS-CNRS, France [2]Université de Toulouse, UPS, INSA, INP, ISAE, LAAS, France [3]Laboratoire instrumentations Monastir, Tunisie

C17

Low-cost bevel-shaped sharp tipped hollow polymer-based microneedles for transdermal drug delivery

B.P. Chaudhri[1,2], F. Ceyssens[1], P. De Moor[2], C. Van Hoof[1,2] and R. Puers[1,2]
[1]ESAT, Department of Electrical Engineering, Katholieke Universiteit Leuven, Belgium [2]IMEC, Belgium

C18

Non-invasive dry electrodes for EEG

M.F. Silva, N.S. Dias, A.F. Silva, J.F. Ribeiro, L.M. Goncalves, J.P. Carmo, P.M. Mendes and J.H. Correia
University of Minho, Dept. Industrial Electronics, Portugal

Session D
(Tuesday 14:45 – 17:15)

D01
Application of silicon micro-needles in liquid-based sensors and vapor transport
Z. Sanaee and S. Mohajerzadeh
University of Tehran, School of Electrical and Computer Eng, Nano-electronic Center of Excellence, Thin Film and Nano-Electronic Lab, Iran

D02
Metallic layer for em pressure sensor sensitivity improvement
S. Bouaziz[1,2], M. Mehdi Jatlaoui[1], D. Mingli[1], P. Pons[1] and H. Aubert[1,2]
[1]CNRS, LAAS, Toulouse, France [1]Université de Toulouse, INP, LAAS, France

D03
Microfabrication and caracterization of thin-films solid-state rechargeable lithium battery
J.F. Ribeiro[1], M.F. Silva[1], L.M. Goncalves[1], M.M. Silva[2] and J.H. Correia[1]
[1]University of Minho, Algoritmi Centre, Portugal [2]University of Minho, Chemistry Centre, Portugal

D04
Determination of young's modulus of PZT- influence of cantilever orientation
H. Nazeer[1], L.A. Woldering[1], L. Abelmann[1] and M.C. Elwenspoek[1,2]
[1]MESA+ institute for nanotechnology, University of Twente, The Netherlands [2]Freiburg institute for Advanced Studies, Albert-Ludwigs-Universitat Freiburg, Germany

D05
Tungsten-siliconnitride medium for mega- to gigayear data storage
J. de Vries[1], L. Abelmann[1], A. Manz[2] and M. Elwenspoek[1,2]
[1]MESA+ institute for nanotechnology, University of Twente, The Netherlands [2]Freiburg institute for Advanced Studies, Albert-Ludwigs-Universitat Freiburg, Germany

D06
Controlled increase and stabilisation of the tuning range of RF-MEMS capacitors with an active lid electrode
J. Love[1], M. Hill[1] and C. O'Mahony[2]
[1]Adaptive Wireless Systems Group, Cork Institute of Technology, Ireland [2]Tyndall National Institute, University College Cork, Ireland

D07
Two-degree-of-freedom capacitive MEMS velocity sensor: initial test measurements
A. Alshehri[1], M. Kraft[1] and P. Gardonio[2]
[1]EDS, University of Southampton, UK [2]DIEGM, Universita' degli Studi di Udine, Italy

D08

Computational analysis of microparticle seperation in straight channels

H. Kizil[1], L. Trabzon[2], L. Yobas[3], M. Yilmaz[1] and A. Ozbey[2]
[1]Department of Materials and Metallurgical Engineering, Istanbul Technical University, Turkey [2]Department of Mechanical Engineering, Istanbul Technical University, Turkey [3]Department of Electronic and Computer Engineering, Hong Kong University of Science and Technology, Hong Kong

D09

Fabrication of cantilever arrays with tips for parallel optical readout

W.W. Koelmans[1], T. Peters[1], L. Abelmann[1] and M.C. Elwenspoek[1,2]
[1]MESA+ and IMPACT Research Institutes, University of Twente, The Netherlands
[2]Freiburg institute for Advanced Studies, Albert-Ludwigs-Universitat Freiburg, Germany

D10

Morphological characterisation of micromachined film bulk acoustic resonator structures manufactured on GaN/Si

A. Cismaru[1], A. Stavrinidis[2], A. Stefanescu[1], D. Neculoiu[1], G. Konstantinidis[2] and A. Müller[1]
[1]IMT-Bucharest, Romania [2]FORTH-IESL-MRG Heraklion, Greece

D11

Static crack growth and fatigue modeling for silicon MEMS

W.M. van Spengen
TU Delft, 3mE-PME, The Netherlands

D12

Development of a novel micromirror with high static rotation angle for measurement applications

S. Weinberger, O. Jakovlev, C.H. Winkelmann, E. Markweg and M. Hoffmann
Ilmenau University of Technology, IMN MacroNano, Department of Micromechanical Systems, Germany

D13

Applications of all-(111) surface silicon nanowires

M. N. Masood, S. Chen, E. T. Carlen and A. van den Berg
BIOS Lab on a Chip, MESA+ Institute for Nanotechnology, University of Twente, The Netherlands

D14

A micromirror for optical projection displays

R.A. Brookhuis[1], M.J. de Boer[1], M. Dijkstra[1], A.A. Kuijpers[2], D. van Lierop[2] and R.J. Wiegerink[1]
[1]MESA+ institute for nanotechnology, University of Twente, The Netherlands
[2]Philips Applied Technologies, Eindhoven, The Netherlands

D15

Frequency shift of MEMS electromechanical resonators induced by process variation

F. Casset[1], J. Arcamone[1], A. Niel[1], E. Lorent[1], Y. Civet[1], E. Ollier[3], P. Renaux[1], P. Ancey[1] and P. Robert[1]
[1]CEA, LETI, MINATEC, France [2]STMicroelectronics, France [3]TIMA, CNRS, Grenoble INP, France

D16

Wet etching optimization for arbitrarily shaped planar electrode structures

H. Rattanasonti[1], R.C. Sterling[2], P. Srinivasan[1], W.K. Hensinger[2] and M. Kraft[1]
[1]School of Electronics and Computer Science, University of Southampton, UK
[1]Department of Physics and Astronomy, University of Sussex, UK

D17

Thermal behaviour of three dimensional single crystalline force sensors

G. Battistig[1], T. Weidisch[2], T. Retkes[2], M. Ádám[1], I. Bársony[1] and T. Mohácsy[1]
[1]Research Institute for Technical Physics and Materials Science - MFA, Hungarian Academy of Sciences, Hungary [2]Department of Electron Devices of the Budapest University of Technology and Economics, Hungary

D18

Incorporation of in-plane electrical interconnects to the reflow bonding

B. Mogulkoc[1], H.V. Jansen[1], H.J.M. ter Brake[1] and M.C. Elwenspoek[1,2]
[1]MESA+ and IMPACT Research Institutes, University of Twente, The Netherlands
[2]Freiburg institute for Advanced Studies, Albert-Ludwigs-Universitat Freiburg, Germany

D19

Piezoelectric power harvesting device with multiple resonant frequencies

Z. Chew and L. Li
Swansea University, School of Engineering, UK

D20

Reliability modelling of MEMS cantilever switches under variable actuation stress levels

P. Fitzgerald[1] and M. Hill[2]
[1]Cork Institute of Technology, Ireland and Analog Devices [1]Cork Institute of Technology, Cork, Ireland