

Conference 6836-ROOM: 16 district, second floor, room 118

Monday-Wednesday 12-14 November 2007 Proceedings of SPIE Vol. 6836

MEMS/MOEMS Technologies and Applications III

Conference Chairs: **Jung-Chih Chiao**, Univ. of Texas at Arlington (USA); **Xuyuan Chen**, Vestfold Univ. College (Norway); **Zhaoying Zhou**, Tsinghua Univ. (China); **Xinxin Li**, Shanghai Institute Microsystem and Information Technology (China).

Monday 12 November

SESSION 1

16 district, the second floor, room 118 Mon. 1:40 pm to 3:10 pm

MOEM I

Chair: **Jung-Chih Chiao**, Univ. of Texas at Arlington (USA)

- 1:40pm: **A Review of Different Types of Photonic MEMS Tunable Lasers** (*Invited Paper*), Ai-Qun Liu, Nanyang Technological Univ. (Singapore)[6836-63]
2:10pm: **Development of a 1x2 piezoelectric optical fiber switch**, Michael Leung, Enrico Haemmerle, Wei Gao, Khairunisak Razak, Gary Yue, Michael Hodgson, Univ. of Auckland (New Zealand) [6836-10]
2:30pm: **An active interconnecting mechanism for free-space optic applications**, Ping Zhang, Kevin Le, Lun-Chen Hsu, Jung-Chih Chiao, Univ. of Texas at Arlington (USA) [6836-41]
2:50pm: **Experimental study on roughness and flatness of micromirror fabricated by different anisotropic silicon etching processes**, Jing Xu, Chinese Academy of Sciences (China)...[6836-61]
Coffee/tea Break 3:10pm to 3:40pm

SESSION 2

16 district, the second floor, room 118..... Monday 3:40pm to 5:10pm

MOEM II

Chair: **Jung-Chih Chiao**, The Univ. of Texas at Arlington (USA)

- 3:40pm: **Optical MEMS devices based on micromachined torsional structure** (*Invited Paper*), Yaming Wu, Chinese Academy of Science (China)..... [6836-64]
4:10pm: **Manufacturing and testing of the line-array fiber optic image slicer based on silicon V-grooves**, Jingqiu Liang, Guo Peng, CIOMP (China) [6836-44]
4:30pm: **Proposal and investigation for a planar wavelength-selective switch**, Xiaoqi Li, Jingqiu Liang, CIOMP (China) [6836-35]
4:50pm: **High-speed Large-scale Electromagnetically Actuated MEMS Scanning-mirror**, Canjun Mu, SIMIT (China) [6836-60]

Tuesday 13 November

SESSION 3

16 district, the second floor, room 118..... Tuesday 8:30am to 9:40am

Microfluidics

Chair: Jung-Chih Chiao, Univ. of Texas at Arlington (USA)

- 8:30am: **AC electro-osmosis microfluidic device featuring Antiparallel-Asymmetric Electrodes to improve delivery and mixing of Cells and Reagents in lab-on-chip systems** (*Invited Paper*), Daniel Lee, Guolin Xu, Institute of Bioengineering and Nanotechnology (Singapore); Yongsheng Tng, Chun Yang, Nanyang Technological Univ. (Singapore); Jackie Ying, Institute of Bioengineering and Nanotechnology (Singapore) [6836-01]
- 9:00am: **A design of microfluid chip with immunochromatographic assay for the detection of alpha-fetoprotein**, Chao Tong, Qinghui Jin, Jianlong Zhao, Shanghai Institute Microsystem and Information Technology (China) [6836-33]
- 9:20am: **Amperometric Immunosensor Using Electric Field to Accelerate the Interaction between Antibody and Antigen**, Jizhou Sun , Institute of Electronics Chinese Academy of Sciences(China) [6836-68]
- Refreshment Break 9:40am to 10:10am

SESSION 4

16 district, the second floor, room 118..... Tuesday 10:10am to 11:40am

Fabrication

Chair: Xinxin Li, Shanghai Institute Microsystem and Information Technology (China)

- 10:10am: **MEMS-based uncooled infrared bolometers** (*Invited Paper*), Frank Niklaus, Royal Institute of Technology (Sweden); Christian Vieider, Acreo AB (Sweden); Henrik Jakobsen, Vestfold Univ. College (Norway) [6836-06]
- 10:40am: **Contrastive Study on the mechanical performance of MEMS microsprings fabricated by LIGA and UV-LIGA technology**, Hua Li, Tsinghua Univ. (China); Gengchen Shi, Beijing Institute of Technology (China) [6836-19]
- 11:00am: **Calibration of computer vision positioning system for MEMS wire bonder**, Junlan Li, Dawei Zhang, Tianjin Univ. (China); Yizhong Wang, Tianjin Univ. of Science and Technology (China); Xingyu Zhao, Tianjin Univ. (China) [6836-09]
- 11:20am: **A micro-electromechanical system design and manufacture considering fabrication error**, Hua Li, Tsinghua Univ. (China); Gengchen Shi, Beijing Institute of Technology (China)..... [6836-22]
- Lunch break..... 11:40am to 1:40 pm

SESSION 5

16 district, the second floor, room 118..... Tues. 1:40pm to 3:10pm

RF MEMS

Chair: Xinxin Li, Shanghai Institute Microsystem and Information Technology (China)

- 1:40pm: **Investigation of charge accumulation in the dielectric for robust RF MEMS switches** (*Invited Paper*), Xuyuan Chen, Ulrik Hanke, Vestfold Univ. College (Norway); Haisheng San,

- Gang Li, Xiamen Univ. (China) [6836-45]
- 2:10pm: **New developments on polymer-based MEMS phase shifters**, Jianqun Wang, Thermpon Ativanichayaphong, Wen-Ding Huang, Ying Cai, Univ. of Texas at Arlington (USA); Mu Chiao, Univ. of British Columbia (Canada); Jung-Chih Chiao, Univ. of Texas at Arlington (USA).....[6836-05]
- 2:30pm: **Influence of ion implantation on dielectric charging in capacitive RF MEMS switches**, Gang Li, Linxian Zhan, Haisheng San, Xuyuan Chen, Xiamen Univ. (China)[6836-27]
- 2:50pm: **Actuation voltage wave-form dependence of charge accumulation in RF MEMS switches**, Haisheng San, Xiamen Univ. (China) [6836-30]
- Refreshment and Poster Break 3:10 to 3:40 pm

SESSION 6

16 district, the second floor, room 118.....Tues. 3:40pm to 5:30pm

Sensors

Chair: Xuyuan Chen, Vestfold Univ. College (Norway)

- 3:40pm: **Integrated Micro Sensors and Systems (Invited Paper)**, Shanghong Xia, Chinese Academy of Sciences (China).....[6836-67]
- 4:10pm: **Research and fabrication of harmonic oscillator with high quality in Si-based MOEMS acceleration seismic geophone**, Zhengrong Tong, Tianjin Univ. of Technology (China).....[6836-14]
- 4:30pm: **A silicon micromachined infrared emitter based on SOI wafer**, Haisheng San, Xuyuan Chen, Xiamen Univ. (China) [6836-17]
- 4:50pm: **An optical fiber detection system for micro-fluidic chip laser-induced fluorescence**, Hong Wang, South China University of Technology (China)..... [6836-65]
- 5:10pm: **Micro Amperometric Immunosensor by Antibody Immobilization with Electropolymerized Protein A**, Chao Bian, Institute of Electronics Chinese Academy of Scienc; Shanhong Xia, State Key Lab of Transducer Technology (China)[6836-69]

Wednesday 14 November

SESSION 7

16 district, the second floor, room 118.....wed. 8:30am to10:00am

Sensor and Actuator

Chair: Xuyuan Chen, Vestfold Univ. College (Norway)

- 8:30am: **Optical fiber accelerometer based on MEMS torsional micro-mirror (Invited Paper)**, Fanlin Zeng, Shanghai Institute Microsystem and Information Technology (China) [6836-62]
- 9:00am: **A novel optical MEMS pressure sensor with a mesa diaphragm**, Yixian Ge, Ming Wang, Xuxing Chen, Hua Rong, Nanjing Normal Univ. (China) [6836-7]
- 9:20am: **Characterizations of microcantilever chemical sensors based on SOI material**, Fangrong Hu, Aina Wang, Hongtao Gao, Chuankai Qiu, Jun Yao, Chinese Academy of Science (China)[6836-48]
- 9:40am: **Actuation voltage shift mechanisms of MEMS capacitive switch based on distributed phase shifter**, Xunjun He, Harbin Univ. of Science and Technology (China); Qun Wu, Harbin Institute of Technology (China) [6836-52]

Tuesday/Wednesday Posters

Time: Tuesday 12:30pm to Wednesday 11:30am

Posters for this conference will be on display all day Tuesday. Poster authors will be available to answer questions during the Tuesday morning and afternoon refreshment breaks.

- √**Study on the image processing algorithms for optical readout based uncooled MEMS IR imager systems**, Liquan Dong, Xiaohua Liu, Yuejin Zhao, Ming Liu, Beijing Institute of Technology (China) [6836-02]
- √**Research of the digital coding mask based on digital micromirror device**, Lu Bai, NingNing Luo, Nanchang Institute of Aeronautical Technology (China) [6836-13]
- √**Fabrication of wall arrays by electrochemical etching of silicon**, Zhigang Zhao, Caili Bai, Jinchuan Guo, Hanben Niu, Shenzhen Univ. (China) [6836-15]
- √**Electrostatic and mechanical coupled simulation for fixed-fixed beam RF MEMS switch**, Xiao Liu, BEN TUNG SAH MEMS RESEARCH CENTRE (China) [6836-20]
- √**Piezoelectric capacitive power generator from vibration energy**, Yang Jian Zhang, Lin Li, Haisheng San, Xiamen Univ. (China); Xuyuan Chen, Vestfold Univ. College (Norway) [6836-23]
- √**Charge accumulation in composite dielectric layers in capacitive RF MEMS switches**, Linxian Zhan, Haisheng San, Gang Li, Xuyuan Chen, Xiamen Univ. (China) [6836-24]
- √**MEMS for vibration energy harvesting**, Lin Li, Yang Jian Zhang, Haisheng San, Yingbiao Guo, Xuyuan Chen, Xiamen Univ. (China) [6836-25]
- √**Study for steel ball surface quality detecting based on vision technique**, Deli Liu, Xianli Liu, Huanrui Hao, Harbin Univ. of Science & Technology (China) [6836-29]
- √**Optimal project system for maskless lithography with DMD**, Xinrong Du, Jianping Ma, Yantao Liu, Zheng Liu, Xi'an Univ. of Technology (China) [6836-34]
- √**Study about the thermal adaptability of mirrors based on MOEMS for satellite-borne laser beam control used in multiple targets tracing**, Xiaofeng Li, Hua Zhang, Fanping Hu, UESTC (China) [6836-39]
- √**A novel microscanning device**, Yun-yi Zhou, ChangCheng Yang, Huazhong Institute of Electro-Optics (China) [6836-54]
- √**Study on bandwidth mutual-benefit between the azimuth and pitch in an optoelectronic tracking system**, Limin Zhang, Juan Chen, Jin Guo, CIOMP (China) [6836-55]
- √**An electromagnetically actuated fiber optic switch using magnetized ferromagnetic materials**, Praveen Pandojirao-S, Pratibha Phuyal, Naresh Dhaubanjari, Jung-Chih Chiao, Univ. of Texas at Arlington (USA) [6836-47]
- √**An optical scanner based on cantilever-type electrostatic zipping actuators**, Smitha Rao, Praveen Pandojirao-Sunkojirao, Naresh Dhaubanjari, Jung-Chih Chiao, Univ. of Texas at Arlington (USA); Mu Chiao, Univ. of British Columbia (Canada) [6836-59]
- √**A fast initial alignment of MIMU in the two-dimension trajectory correction fuze**, Qin Wang, Shi-yi Li, Beijing Institute of Technology (China) [6836-36]
- √**The mechanism study and design of oxygen microsensor based on micro-electromechanical system**, Huangping Yan, Yong-jian Feng, Yuanqing Huang, Xiamen Univ. (China) [6836-16]
- √**Modular microstructure testing system based on microvision and microscopic interferometry**, Tong Guo, Tianjin Univ. (China) [6836-18]
- √**Research of curved-surface whirl coating and photoresist thickness measurement**, Long

Jiang Chen, GuoGuang Yang, YiYong Liang, ZheJiang Univ. (China) [6836-31]
 √**Design and analysis of electrostatic micromirror for optics aberrations correction**, Hongtao Gao, Chuankai Qiu, Fangrong Hu, Aina Wang, Jun Yao, Chinese Academy of Science (China)..... [6836-49]
 √**Chemical mechanical polishing for nickel used in MEMS devices**, Biyan Wu, Zhejiang Gongshang Univ. (China) [6836-56]
 √**Mechanical characterizations analysis of electroactuated MEMS capacitive switches**, Xunjun He, Harbin Univ. of Science and Technology (China); Qun Wu, Harbin Institute of Technology (China) [6836-53]