

ACTUATOR 16

International Conference and Exhibition
on New Actuators and Drive Systems

Bremen, Germany
13–15 June 2016

**Conference
Programme**



 **MESSE
BREMEN**
www.actuator.de



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Monday 13 June			
Hanse Saal	Borgward Saal	Focke Wulf Saal	
Session A	Session B	Session C	Technical Visits
8:45 Opening			
9:00 Review A1			
9:30 Review B1			
10:00 Review C1			
10:30 Coffee Break in the Exhibition Area (Hall 4.1)			
11:00 A1 Piezoelectric Actuators	11:00 B1 (Bio-) Medical Applications	11:00 C1 Polymer Actuators	
13:00 Lunch in the Exhibition Area (Hall 4.1)			
15:00 Review B2			
15:30 Review C2			
16:00 A1 Piezoelectric Actuators (cont.)	16:00 B2 Haptic/Tactile Applications	16:00 C2 Shape Memory Actuators	16:00 Drop Tower Bremen
17:30–19:30 Poster Session Foyer Hall 4.1			

Tuesday 14 June			
Hanse Saal	Borgward Saal	Focke Wulf Saal	
Session A	Session B	Session C	Technical Visits
9:00 Review A3			
9:30 Review B3			
10:00 Review C3			
10:30 Coffee Break in the Exhibition Area (Hall 4.1)			
11:00 A3 Magnetostrictive/MSM Actuators	11:00 B3 Piezo Actuator Applications	11:00 C3 Micro Actuators/Microfluid Handling Devices	
12:20 Lunch in the Exhibition Area (Hall 4.1)			
14:20 Review C4			
14:50 Review C5			
15:20 A3 Magnetostrictive/MSM Actuators (cont.)	15:20 B3 Piezo Actuator Applications (cont.)	15:20 C4 MRF Actuators	15:30 Mercedes Benz Factory Tour
16:40 Coffee Break in the Exhibition (Hall 4.1)			
17:10 A3 Magnetostrictive/MSM Actuators (cont.)	17:10 B3 Piezo Actuator Applications (cont.)	17:10 C5 Actuator Control	
19:30 Welcome Reception/Get-together (Foyer ÖVB ARENA)			

Wednesday 15 June			
Hanse Saal	Borgward Saal	Focke Wulf Saal	
Session A	Session B	Session C	Technical Visits
9:00 Review A6			
9:30 Review B6			
10:00 Review C6			
10:30 Coffee Break in the Exhibition Area (Hall 4.1)			
11:00 A6 Active Vibration/Active Noise Control	11:00 B6 Aerospace Applications	11:00 C6 Low-Power Electromagnetic Actuators	11:30 Astrium Aerospace Tour
12:40 Closing Remarks			
13:00 Lunch in the Exhibition Area (Hall 4.1)			
15:00 End of Conference			

Monday 13 June 2016

A1 Piezoelectric Actuators		Hanse Saal
9:00–9:30	A1.0	Piezoelectric Actuators 2016 – Professors' Misconceptions Top 10 (Review) K. Uchino
10:30		Coffee Break (Hall 4.1)
11:00–11:20	A1.1	Electromechanical Properties and Fatigue Resistance of the Lead-Free Ba(Zr_{0.2}Ti_{0.8})O₃-x(Ba_{0.7}Ca_{0.3})TiO₃ System V. Rojas*, J. Koruza, M. Acosta, D. Brandt, K. Webber, J. Rödel
11:20–11:40	A1.2	Temperature Dependency of the Hysteresis Behaviour of PZT Actuators Using Preisach Model C. Mangeot*, T.-G. Zsurzsan
11:40–12:00	A1.3	Should We Drive Transducers at Their Resonance Frequency? H. Shekhani, W. Shi, M. Majzoubi, M. Choi, A. Bansal, K. Uchino
12:00–12:20	A1.4	Single-Sided Contacting of Out-of-Plane Polarized Piezo Films for Fluid Membrane Lenses M. Stürmer*, M.C. Wapler, U. Wallrabe
12:20–12:40	A1.5	Tailored Composite Transducers Based on Piezoceramic Fibers and Pearls K. Hohlfeld*, P. Neumeister, A. Michaelis, S. Gebhardt
12:40–13:00	A1.6	Dynamic Characterization of an Amplified Piezoelectric Actuator R. Lucinskis
13:00		Lunch Break (Hall 4.1)

B1 (Bio-) Medical Applications		Borgward Saal
9:30–10:00	B1.0	Embedded Sensors and Actuators for Gentle Insertion of Cochlear Implants (Review, Hanse Saal) L.A. Kahrs
10:30		Coffee Break (Hall 4.1)
11:00–11:20	B1.1	Microhydraulic Drives with Integrated Displacement Sensor for Medical Application L.M. Comella*, K. Ayyavoz, R. Kessel, T. Cuntz, A. van Poelgeest
11:20–11:40	B1.2	A Variable Impedance Actuator Using Shape Memory Alloy L. Manfredi*, H. Khan, A. Cuschieri
11:40–12:00	B1.3	Piezoelectric Hydrocephalus Shunt Valve – Design and First Evaluation Results P.P. Pott, G. Allevato, M. Bartenschlager, J. Butz, P. Schmitt, H.F. Schlaak
12:00–12:20	B1.4	Hybrid Haptic Display for Providing Sensory Feedback H. Huang, T. Li, V. Koch
13:00		Lunch Break (Hall 4.1)

09:00 – 13:00

C1 Polymer Actuators		Focke Wulf Saal
10:00–10:30	C1.0	Elastomers for Dielectric Electroactive Polymer Applications (Review, Hanse Saal) A. Köllnberger*, H.F. Schlaak
10:30		Coffee Break (Hall 4.1)
11:00–11:20	C1.1	Customized Dielectric Elastomer Stack-Actuators Under Consideration of Application Specifications B. von Heckel, T. Hoffstadt, J. Maas
11:20–11:40	C1.2	A Compact High-Force Dielectric Elastomer Membrane Actuator S. Hau*, A. York, S. Seelecke
11:40–12:00	C1.3	Magneto-Active Polymer Actuator A. Diermeier*, D. Sindensberger, G. Monkman
12:00–12:20	C1.4	Haptic Actuators Based on Magnetoactive Polymers H. Böse*, J. Ehrlich
12:20–12:40	C1.5	Magneto-Rheological Elastomer Actuators for a Reconfigurable Joystick J. Bilz, H. Böse, M. Kupnik, C. Hatzfeld
12:40–13:00	C1.6	Plasticized-Polymer Actuators with Colossal Dielectric Constant – Electro-Mechanical & Electro-Optical Functions T. Hirai
13:00		Lunch Break (Hall 4.1)

A1 Piezoelectric Actuators		Hanse Saal		B2 Haptic / Tactile Applications		Borgward Saal		C2 Shape Memory Actuators		Focke Wulf Saal	
				15:00 – 15:30 B2.0	Haptic Feedback: From Force-Feedback Robots to Tactile Interfaces (Invited Review, Hanse Saal) M. Wiertelwski			15:30 – 16:00 C2.0	Recent Developments in Shape Memory Alloys (Invited Review, Hanse Saal) H. Maier		
16:00 – 16:20 A1.7	Development of a Piezoelectric Micro Switch L. Seyfert*, S. Zähringer, N. Schwesinger, C. Müller, S. Buhr	16:00 – 16:20 B2.1	Design of Haptic Master Featuring Improved MR Brakes H.G. Gang, J.W. Sohn*	16:00 – 16:20 C2.1	Advances in NiTi-Based SMA for Actuators A. Coda, L. Fumagalli						
16:20 – 16:40 A1.8	Characteristics of Ultrasonic Suspension Actuation Force M. Takasaki, S. Chino, R. Chida, Y. Ishino, T. Mizuno	16:20 – 16:40 B2.2	Haptic Guidance in Comanipulated Laser Surgery for Fetal Disorders C. Gruijthuijsen, A. Javaux, G. Borghesan, T. Vercauteren, D. Stoyanov, S. Ourselin, J. Perret, D. Reynaerts, E. Vander Poorten	16:20 – 16:40 C2.2	Industrial Safety Systems Using Shape Memory Alloy Actuators A. Czechowicz, B. Rachor, F. Hoffmann						
16:40 – 17:00 A1.9	Encapsulated Piezo Actuators for Use at High Power Levels and / or within Harsh Environmental Conditions F. Barillot*, S. Rowe, A. Pages, F. Claeysen	16:40 – 17:00 B2.3	Normal Force Actuator for a Tactile Display Using a Micromechanically Built Spring Element Made of Polyimide M. Rechel, V. Hofmann, J. Twiefel, M. Wurz	16:40 – 17:00 C2.3	Compact Bi-Stable SMA Actuator P. Motzki*, S. Seelecke						
17:00 – 17:20 A1.10	Dynamic Control of Ultrasonic Transducer's Resonant Frequency Using MOSFET Switching H. Yokozawa*, J. Twiefel, M. Weinstein, T. Morita	17:00 – 17:20 B2.4	Investigation of Smart Materials for Haptic Feedback Applications H. Bochmann, J. Maas	17:00 – 17:20 C2.4	Analysis of Performance and Energy Efficiency of Thin Shape Memory Alloy Wire-Based Actuators H. Khan*, A. Cuschieri, L. Manfredi						
17:30 – 19:30	Poster Session (Foyer Hall 4.1)										

A3 Magnetostrictive/MSM Actuators		Hanse Saal
9:00 –9:30 A3.0	Magnetic Shape Memory Actuation: Trends and Design Concepts (Review) P. Müllner*, E. Pagounis	
10:30	Coffee Break (Hall 4.1)	
11:00 –11:20 A3.1	Fast Actuation of Magnetic Shape Memory Material Ni-Mn-Ga Using Pulsed Magnetic Field A. Saren*, J. Tellinen, D. Musiienko, K. Ullakko	
11:20 –11:40 A3.2	Physics of Energy Barriers for Twin Boundary Motion in Ni-Mn-Ga E. Faran, N. Zreihan, I. Benichou, S. Givli, D. Shilo	
11:40 –12:00 A3.3	An Effective Method for Designing Magnetic Shape Memory Actuator Systems F. Ehle, P. Neumeister, H. Neubert	
12:00 –12:20 A3.4	Materials Design for Magnetostrictive Thin Films A. Sakai*, C. Niyomwaitaya, A.A.Y Mansi, T. Washihira, Y. Matsumura	
12:20	Lunch Break (Hall 4.1)	
15:20 –15:40 A3.5	Ferromagnetic Shape Memory Flapper for Remotely Actuated Propulsion Systems D. Shilo, O. Kanner, J. Sheng, R. James, Y. Ganor	
15:40 –16:00 A3.6	Design and Modelling of a Sensor-Integrated Actuator Using Combined Effects of Magnetostriction and Piezoelectricity M. Niu*, B. Yang, G. Meng	

B3 Piezo Actuator Applications		Borgward Saal
9:30 –10:00 B3.0	Miniature Piezoelectric Multilayer Actuators and their Applications (Review, Hanse Saal) W.A. Groen, P. Pertsch	
10:30	Coffee Break (Hall 4.1)	
11:00 –11:20 B3.1	Micro Ultrasonic Motor Using One Cubic Millimeter Stator T. Mashimo	
11:20 –11:40 B3.2	An Ultrasonic Motor Using Side-Push of Center-Attached Eyelets on an Octagonal Piezoelectric Plate B. Koc	
11:40 –12:00 B3.3	Resonance Asymmetric Rectangular Pulse Drive of Piezoelectric Motors Y. Ma*, H. Shekhani, M. Choi, K. Uchino	
12:00 –12:20 B3.4	Module Stepping Piezoelectric Actuator – A Versatile Way of Micro-Positioning Actuation F. Barillot*, F. Dubois, C. Belly, T. Forrissier, A. Saulot, Y. Berthier	
12:30	Lunch Break (Hall 4.1)	
15:20 –15:40 B3.5	Muscle-Like Piezohydraulic Actuators for Robotic Grippers W. Zoels, I. Vittorias, G. Bachmaier	
15:40 –16:00 B3.6	Topological In-Plane Polarized Actuation for Compact Adaptive Lenses with Aspherical Correction F. Lemke*, M. Stürmer, U. Wallrabe, M.C. Wapler	

C3 Micro Actuators / Microfluid Handling Devices		Focke Wulf Saal
10:00 –10:30 C3.0	Integrated Systems for the Accurate Measurement and Control of Micro Liquid and Gas Flows (Review, Hanse Saal) J.C. Lötters	
10:30	Coffee Break (Hall 4.1)	
11:00 –11:20 C3.1	Resonant Three-Dimensional Electrostatic Actuator in Silicon Technology B. Goj*, L. Dressler, L. Dittrich, M. Hoffmann	
11:20 –11:40 C3.2	Mono-Dispersed Droplets Generation in the Flowing Ambient Liquid by Using an Ultrasonic Vibrator T. Kanda*, T. Yamada, K. Mori, K. Suzumori	
11:40 –12:00 C3.3	Cost-Efficient Manufacturing of a High Deflection Electrothermal Drive for Switching Applications M. El Khoury*, T. Winterstein, H.F. Schlaak	
12:00 –12:20 C3.4	SMA Shape-Memory Microvalves for Fluidic Systems C. Megnin*, H. Ossmer, M. Gültig, T. Hanemann, M. Kohl	
12:30	Lunch Break (Hall 4.1)	
14:20 –14:50 C4.0	Automotive MR Actuators – State of Art (Review, Hanse Saal) J. Goldasz	Focke Wulf Saal
15:20 –15:40 C4.1	Controlling the Magnetorheological Effect Using Vibrations E. Leroy*, P.-H. Orefice, L. Eck, M. Hafez	
15:40 –16:00 C4.2	Hybrid Magnetorheological Damper M. Jackel*, J. Klopfer, M. Matthias	

16:00 –16:20 A3.7	Impulse Damping Using Magnetic Shape Memory Alloys L. Riccardi, T. Schiepp, R. Schmid, M. Laufenberg
16:20 –16:40 A3.8	Magnetic Field Controlled Damping in MSM-Polymer Hybrids I. Aaltio*, F. Nilsén, J. Lehtonen, Y. Ge, S.-P. Hannula
16:40	Coffee Break (Hall 4.1)
17:10 –17:30 A3.9	Disparities in Radial Properties (Magnetic and Structural) of Single Crystal Terfenol-D Disks V. Issindou*, B. Viala, L. Gimeno, O. Cugat, O. Geoffroy, F. Fillot, J. Debray
17:30 –17:50 A3.10	Study of Vibration Energy Harvester Based on the Magnetic Shape Memory Effect D. Musiienko, J. Huimasalo, J. Tellinen, A. Saren, K. Ullakko
19:30 –22:30	Welcome Reception / Get-together (Foyer ÖVB-Arena)

16:00 –16:20 B3.7	Deformable Bimorph Mirrors for Adaptive Optics in Space Telescopes D. Alaluf*, R. Bastiais, G. Martic, A. Preumont
16:20 –16:40 B3.8	Application of Combined Ultrasonic-Levitation-Magnetic-Actuators in Machine Guideways B. Denkena, J. Reiners*, J. Wallaschek, J. Twiefel, I. Ille
16:40	Coffee Break (Hall 4.1)
17:10 –17:30 B3.9	High Response Proportional Flow Control Valve Using Particle Excitation D. Hirooka, T. Yamguchi, N. Furushiro, K. Suzumori, T. Kanda
17:30 –17:50 B3.10	Performance of a Novel Small Component Conveyor Utilizing Flexural Traveling Waves T. Wielert, J. Twiefel, I. Mešan, K. Bott

16:00 –16:20 C4.3	Energy-Efficient MRF-Based Clutches in Hybrid Powertrains C. Hegger*, J. Maas	
16:20 –16:40 C4.4	Magnetorheological Actuator for Haptic Applications M.E. Busse-Grawitz, R. Pittini, R. Waldvogel, D. Martin	
16:40	Coffee Break (Hall 4.1)	
14:50 –15:20 C5.0	Combining Usability and Performance – What Smart Actuators Can Learn from Automatic Commissioning of Variable Speed Drives (Invited Review, Hanse Saal) A. Wahrburg, K. Listmann	Focke Wulf Saal
17:10 –17:00 C5.1	Control of a Compact Electrodynamic Planar Actuator M. Stock*, T. Bödrich, J. Lienig	
17:30 –17:50 C5.2	Vector Control of a Travelling Wave Ultrasonic Motor: Application to Efficiency Improvement by Voltage Reduction F. Giraud*, C. Giraud-Audine, M. Amberg, B. Lemaire-Semal	
17:50 –18:10 C5.3	Power Electronics and Control Concepts for Driving Dielectric Elastomer Transducers T. Hoffstadt, J. Maas	

Invitation

to

ACTUATOR 16

15th International Conference on New Actuators

9th International Exhibition on Smart Actuators and Drive Systems

Bremen, Germany, 13–15 June 2016

Organised by



MESSE BREMEN
WFB Wirtschaftsförderung Bremen GmbH

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- ▶ The Association of German Engineers (VDI), Germany, Local Chapter Bremen
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MESSE BREMEN, Germany

Welcome

"After the jubilee is prior to the next one!" In 2014 we proudly looked back on 25 years of ACTUATOR event series. Thanks to a number of sponsors, we were able to celebrate an adequate birthday party together with all conference delegates and exhibitors gathered for ACTUATOR 2014. A quarter of a century – almost one generation of researchers. Such a long-time performance proves a wide acceptance within the world-wide actuator community as well as a certain quality standard maintained during these years. We have always noticed a change of interest, new actuation technologies dedicated to emerge, others dedicated to go down and to return with a new approach. Nevertheless, we should not spend much time in looking back on success stories and disappointments. It's time to focus onto the future. We are sure that ACTUATOR is still up-to-date even after this long period. The courses are already set!

Just in time with the publication of the Announcement / Call for Papers we launched a new event homepage, we re-arranged the chairmen's session responsibility as well as the session schedule. Some very close committee members who had retired after quite a number of years of reliable cooperation had to be replaced by new members. A very warm thank-you to all of them and welcome to their successors!

The response to the current Call for Papers was a little bit less than in 2014, maybe due to competing technology events held in Europe in the same week. In total 144 conference contributions, 86 oral presentations and 58 posters will be portraying state of the art technology and indicating future trends. Again, the conference will close with a common lunch on Wednesday.

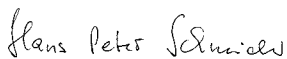
Including all reviews, a 2016 conference participant has the chance to listen to as many as 39 well selected oral contributions. As usual, all the other contributions, including the posters, will be properly documented in the proceedings. We hope that the conflicts of interest will have been minimised by a well-selected placement of the sessions in the general schedule.

We are sure that besides the presentations this schedule offers sufficient time for visiting the exhibition, for networking within the community as well as for the accompanying programme.

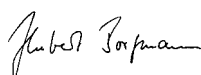
For those of you who are also in charge of smart structures based on fibre composites we recommend our new event series started in 2012: ITHEC, International Conference and Exhibition on Thermoplastic Composites. The upcoming event, ITHEC 2016, will be held 11 – 12 October 2016 at the same location. Details may be found on www.ithec.de.

The Programme Committee, the exhibitors and the organiser would be pleased to welcome you to the 15th International Conference on New Actuators and the 9th International Exhibition on Smart Actuators and Drive Systems in June 2016.

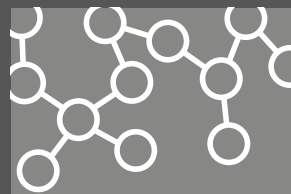
We are looking forward to having you in Bremen



Hans Peter Schneider
MESSE BREMEN
General Manager



Hubert Borgmann
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Monday 13 June 2016, 09:00–17:20, Hanse Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session A1 Piezoelectric Actuators

Session Chair A. Ando / K. Uchino

09:00 –09:30	A1.0	Piezoelectric Actuators 2016 – Professors' Misconceptions Top 10 (Review) K. Uchino, The Pennsylvania State University, University Park, USA
10:30–11:00		Coffee Break (Hall 4.1)
11:00 –11:20	A1.1	Electromechanical Properties and Fatigue Resistance of the Lead-Free Ba(Zr_{0.2}Ti_{0.8})O₃-x(Ba_{0.7}Ca_{0.3})TiO₃ System V. Rojas*, Technische Universität Darmstadt, Darmstadt, Germany J. Koruza, Technische Universität Darmstadt, Darmstadt, Germany M. Acosta, Technische Universität Darmstadt, Darmstadt, Germany D. Brandt, Technische Universität Darmstadt, Darmstadt, Germany K. Webber, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany J. Rödel, Technische Universität Darmstadt, Darmstadt, Germany
11:20 –11:40	A1.2	Temperature Dependency of the Hysteresis Behaviour of PZT Actuators Using Preisach Model C. Mangeot*, Noliac A/S, Kvistgaard, Denmark T.-G. Zsurzsan, Technical University of Denmark, Lyngby, Denmark
11:40 –12:00	A1.3	Should We Drive Transducers at Their Resonance Frequency? H. Shekhani, The Pennsylvania State University, University Park, USA W. Shi, Harbin Institute of Technology, Harbin, China M. Majzoubi, The Pennsylvania State University, University Park, USA M. Choi, The Pennsylvania State University, University Park, USA A. Bansal, The Pennsylvania State University, University Park, USA K. Uchino*, The Pennsylvania State University, University Park, USA
12:00 –12:20	A1.4	Single-Sided Contacting of Out-of-Plane Polarized Piezo Films for Fluid Membrane Lenses M. Stürmer*, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany M.C. Wapler, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany U. Wallrabe, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany

Monday 13 June 2016, 12:20–17:20, Hanse Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

12:20 –12:40	A1.5	Tailored Composite Transducers Based on Piezoceramic Fibers and Pearls K. Hohfeld*, Technische Universität Dresden, Dresden, Germany P. Neumeister, Fraunhofer IKTS, Dresden, Germany A. Michaelis, Technische Universität Dresden, Dresden, Germany, and Fraunhofer IKTS, Dresden, Germany S. Gebhardt, Fraunhofer IKTS, Dresden, Germany
12:40 –13:00	A1.6	Dynamic Characterization of an Amplified Piezoelectric Actuator R. Lucinskis, Noliac A/S, Kvistgaard, Denmark
13:00–15:00		Lunch Break (Hall 4.1)
16:00 –16:20	A1.7	Development of a Piezoelectric Micro Switch L. Seyfert*, Technische Universität München, München, Germany S. Zähringer, Technische Universität München, München, Germany N. Schwesinger, Technische Universität München, München, Germany C. Müller, Technische Universität München, München, Germany S. Buhr, Technische Universität München, München, Germany
16:20 –16:40	A1.8	Characteristics of Ultrasonic Suspension Actuation Force M. Takasaki, Saitama University, Saitama-shi, Japan S. Chino, Saitama University, Saitama-shi, Japan R. Chida, Saitama University, Saitama-shi, Japan Y. Ishino, Saitama University, Saitama-shi, Japan T. Mizuno, Saitama University, Saitama-shi, Japan
16:40 –17:00	A1.9	Encapsulated Piezo Actuators for Use at High Power Levels and / or within Harsh Environmental Conditions F. Barillot*, Cedrat Technologies SA, Meylan, France S. Rowe, Cedrat Technologies SA, Meylan, France A. Pages, Cedrat Technologies SA, Meylan, France F. Claeysen, Cedrat Technologies SA, Meylan, France
17:00 –17:20	A1.10	Dynamic Control of Ultrasonic Transducer's Resonant Frequency Using MOSFET Switching H. Yokozawa*, The University of Tokyo, Kashiwa-shi, Japan J. Twiefel, Leibniz Universität Hannover, Hannover, Germany M. Weinstein, Leibniz Universität Hannover, Hannover, Germany T. Morita, The University of Tokyo, Kashiwa-shi, Japan
17:30–19:30		Poster Session in the Foyer Hall 4.1

Tuesday 14 June 2016, 09:00–17:50, Hanse Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session A3 Magnetostrictive / MSM Actuators

Session Chair P. Müllner / E. Pagounis

09:00 –09:30	A3.0	Magnetic Shape Memory Actuation: Trends and Design Concepts (Review) P. Müllner*, Boise State University, Boise, USA E. Pagounis, ETO MAGNETIC GmbH, Stockach, Germany
10:30–11:00		Coffee Break (Hall 4.1)
11:00 –11:20	A3.1	Fast Actuation of Magnetic Shape Memory Material Ni-Mn-Ga Using Pulsed Magnetic Field A. Saren*, Lappeenranta University of Technology, Savonlinna, Finland J. Tellinen, Lappeenranta University of Technology, Savonlinna, Finland D. Musiienko, Lappeenranta University of Technology, Savonlinna, Finland K. Ullakko, Lappeenranta University of Technology, Savonlinna, Finland
11:20 –11:40	A3.2	Physics of Energy Barriers for Twin Boundary Motion in Ni-Mn-Ga E. Faran, Technion - Israel Institute of Technology, Haifa, Israel N. Zreihan, Technion - Israel Institute of Technology, Haifa, Israel I. Benichou, Technion - Israel Institute of Technology, Haifa, Israel S. Givli, Technion - Israel Institute of Technology, Haifa, Israel D. Shilo, Technion - Israel Institute of Technology, Haifa, Israel
11:40 –12:00	A3.3	An Effective Method for Designing Magnetic Shape Memory Actuator Systems F. Ehle, Fraunhofer IKTS, Dresden, Germany P. Neumeister, Fraunhofer IKTS, Dresden, Germany H. Neubert, Fraunhofer IKTS, Dresden, Germany
12:00 –12:20	A3.4	Materials Design for Magnetostrictive Thin Films A. Sakai*, Tokai University, Hiratsuka-shi, Japan C. Niyomwaitaya, Tokai University, Hiratsuka-shi, Japan A.A.Y Mansi, Tokai University, Hiratsuka-shi, Japan T. Washihira, Tokai University, Hiratsuka-shi, Japan Y. Matsumura, Tokai University, Hiratsuka-shi, Japan
12:20–14:20		Lunch Break (Hall 4.1)

Tuesday 14 June 2016, 09:00–17:50, Hanse Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

15:20 –15:40	A3.5	Ferromagnetic Shape Memory Flapper for Remotely Actuated Propulsion Systems D. Shilo, Technion - Israel Institute of Technology, Haifa, Israel O. Kanner, Yale University, New Haven, USA J. Sheng, University of Minnesota, Minneapolis, USA R. James, University of Minnesota, Minneapolis, USA Y. Ganor, Philips Health Systems, Andover, USA
15:40 –16:00	A3.6	Design and Modelling of a Sensor-Integrated Actuator Using Combined Effects of Magnetostriction and Piezoelectricity M. Niu*, Shanghai Jiao Tong University, Shanghai, China B. Yang, Shanghai Jiao Tong University, Shanghai, China G. Meng, Shanghai Jiao Tong University, Shanghai, China
16:00 –16:20	A3.7	Impulse Damping Using Magnetic Shape Memory Alloys L. Riccardi, ETO MAGNETIC, Stockach, Germany T. Schiepp, ETO MAGNETIC, Stockach, Germany R. Schmid, ETO MAGNETIC, Stockach, Germany M. Laufenberg, ETO MAGNETIC, Stockach, Germany
16:20 –16:40	A3.8	Magnetic Field Controlled Damping in MSM-Polymer Hybrids I. Aaltio*, Aalto University, Espoo, Finland F. Nilsén, Aalto University, Espoo, Finland J. Lehtonen, Aalto University, Espoo, Finland Y. Ge, Aalto University, Espoo, Finland S.-P. Hannula, Aalto University, Espoo, Finland
16:40–17:10		Coffee Break (Hall 4.1)
17:10 –17:30	A3.9	Disparities in Radial Properties (Magnetic and Structural) of Single Crystal Terfenol-D Disks V. Issindou*, CEA LETI, Grenoble, France B. Viala, CEA LETI, Grenoble, France L. Gimeno, Université Grenoble Alpes, Grenoble, France, and CNRS, Grenoble, France O. Cugat, Université Grenoble Alpes, Grenoble, France, and CNRS, Grenoble, France O. Geoffroy, CNRS Louis Néel, Grenoble, France F. Fillot, CEA LETI, Grenoble, France, and Université Grenoble Alpes, Grenoble, France J. Debray, Institut Néel, Grenoble, France, and CNRS Institut Néel, Grenoble, France
17:30 –17:50	A3.10	Study of Vibration Energy Harvester Based on the Magnetic Shape Memory Effect D. Musiienko, Lappeenranta University of Technology, Savonlinna, Finland J. Huimasalo, MAMK, Savonlinna, Finland J. Tellinen, Lappeenranta University of Technology, Savonlinna, Finland A. Saren, Lappeenranta University of Technology, Savonlinna, Finland K. Ullakko, Lappeenranta University of Technology, Savonlinna, Finland
19:30–22:30		Welcome Reception / Get-together (Foyer ÖVB Arena)

Wednesday 15 June 2016, 09:00–12:40, Hanse Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session A6 Active Vibration / Active Noise Control

Session Chair H.-J. Karkosch / A. Preumont

09:00 A6.0 Vibration Control of Large Civil Engineering Structures
– 09:30 (Review)

A. Preumont, Université Libre de Bruxelles,
Bruxelles, Belgium

10:30–11:00 Coffee Break (Hall 4.1)

11:00 A6.1 Actuator Concepts for Active Vibration Control
– 11:20

M. Werhahn*, ContiTech Vibration Control GmbH,
Hannover, Germany
R. Genderjahn, ContiTech Vibration Control GmbH,
Hannover, Germany
H.-J. Karkosch, ContiTech Vibration Control GmbH,
Hannover, Germany
P. Marienfeld, ContiTech Vibration Control GmbH,
Hannover, Germany

11:20 A6.2 An Efficient and Optimal Moving Magnet
– 11:40 **Actuator for Active Vibration Control**

G. Loussert*, Moving Magnet Technologies SA,
Besançon, France

11:40 A6.3 Compact, Efficient and Controllable Moving
– 12:00 **Iron Actuation Chain for Industrial Application**

P. Meneroud*, Cedrat Technologies SA, Meylan, France
C. Bouchet, Cedrat Technologies SA, Meylan, France
A. Pages, Cedrat Technologies SA, Meylan, France

12:00 A6.4 An Adaptive Negative Capacitance Shunt Network for
– 12:20 **Increasing Performance and Robustness in Terms of Noise and Vibration Attenuation**

M. Pohl*, Deutsches Zentrum für Luft- und Raumfahrt
(DLR), Braunschweig, Germany
H.P. Monner, Deutsches Zentrum für Luft- und Raumfahrt
(DLR), Braunschweig, Germany

12:20 A6.5 Adaptive Dynamic Absorber for Wideband
– 12:40 **Micro-Vibration Control Based on Precision Self-Positioning Linear Actuator**

X. Wang, Shanghai Jiao Tong University, Shanghai, China
B. Yang*, Shanghai Jiao Tong University, Shanghai, China

12:40–12:50 Closing Remarks (Hanse Saal)

13:00–15:00 Lunch Break (Hall 4.1)

15:00 End of Conference

Monday 13 June 2016, 9:30 – 12:20, Borgward Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session B1 (Bio-) Medical Applications

Session Chair G. Kullik / L.A. Kahrs

09:30 B1.0 Embedded Sensors and Actuators
– 10:00 **for Gentle Insertion of Cochlear Implants** (Review)

Hanse Saal L.A. Kahrs, Leibniz Universität Hannover, Hannover, Germany

10:30–11:00 Coffee Break (Hall 4.1)

11:00 B1.1 Microhydraulic Drives with Integrated Displacement
– 11:20 **Sensor for Medical Application**

L.M. Comella*, Fraunhofer IPA, Mannheim, Germany
K. Ayvazov, Fraunhofer IPA, Mannheim, Germany
R. Kessel, Fraunhofer IPA, Mannheim, Germany
T. Cuntz, Fraunhofer IPA, Mannheim, Germany
A. van Poelgeest, Fraunhofer IPA, Mannheim, Germany

11:20 B1.2 A Variable Impedance Actuator Using
– 11:40 **Shape Memory Alloy**

L. Manfredi*, University of Dundee, Dundee,
United Kingdom
H. Khan, University of Dundee, Dundee,
United Kingdom
A. Cuschieri, University of Dundee, Dundee,
United Kingdom

11:40 B1.3 Piezoelectric Hydrocephalus Shunt Valve –
– 12:00 **Design and First Evaluation Results**

P.P. Pott, Technische Universität Darmstadt,
Darmstadt, Germany
G. Allevalo, Technische Universität Darmstadt,
Darmstadt, Germany
M. Bartenschlager, Technische Universität Darmstadt,
Darmstadt, Germany
J. Butz, Technische Universität Darmstadt,
Darmstadt, Germany
P. Schmitt, Technische Universität Darmstadt,
Darmstadt, Germany
H.F. Schlaak, Technische Universität Darmstadt,
Darmstadt, Germany

12:00 B1.4 Hybrid Haptic Display for Providing Sensory Feedback
– 12:20

H. Huang, Berner Fachhochschule, Biel, Switzerland, and
Ecole Polytechnique Fédérale de Lausanne, Neuchâtel,
Switzerland
T. Li, Berner Fachhochschule, Biel, Switzerland
V. Koch, Berner Fachhochschule, Biel, Switzerland

13:00–15:00 Lunch Break (Hall 4.1)

Session B

Monday 13 June 2016, 15:00 – 17:20, Borgward Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session B2 Haptic / Tactile Applications

Session Chair J. Perret / E. Vander Poorten

15:00 – 15:30	B2.0	Haptic Feedback: From Force-Feedback Robots to Tactile Interfaces (Invited Review) M. Wiertlewski, Aix-Marseille Université, Marseille, France
16:00 – 16:20	B2.1	Design of Haptic Master Featuring Improved MR Brakes H.G. Gang*, Kumoh National Institute of Technology, Gumi-si, South Korea J.W. Sohn, Kumoh National Institute of Technology, Gumi-si, South Korea
16:20 – 16:40	B2.2	Haptic Guidance in Comanipulated Laser Surgery for Fetal Disorders C. Gruijthuijsen, Katholieke Universiteit Leuven, Leuven, Belgium A. Javaux, Katholieke Universiteit Leuven, Leuven, Belgium G. Borghesan, Katholieke Universiteit Leuven, Leuven, Belgium T. Vercauteren, University College London, London, United Kingdom D. Stoyanov, University College London, London, United Kingdom S. Ourselin, University College London, London, United Kingdom E. Vander Poorten, Katholieke Universiteit Leuven, Leuven, Belgium J. Perret, Haption, Soulgé-sur-Outte, France D. Reynaerts, Katholieke Universiteit Leuven, Leuven, Belgium
16:40 – 17:00	B2.3	Normal Force Actuator for a Tactile Display Using a Micromechanically Built Spring Element Made of Polyimide M. Rechel, Leibniz Universität Hannover, Garbsen, Germany V. Hofmann, Leibniz Universität Hannover, Hannover, Germany J. Twiefel, Leibniz Universität Hannover, Hannover, Germany M. Wurz, Leibniz Universität Hannover, Garbsen, Germany
17:00 – 17:20	B2.4	Investigation of Smart Materials for Haptic Feedback Applications H. Bochmann, Hochschule Ostwestfalen-Lippe, Lemgo, Germany J. Maas, Hochschule Ostwestfalen-Lippe, Lemgo, Germany
17:30 – 19:30		Poster Session in the Foyer Hall 4.1

Session B

Tuesday 14 June 2016, 9:30 – 17:50, Borgward Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session B3 Piezo Actuator Applications

Session Chair W.A. Groen / P. Pertsch

09:30 – 10:00	B3.0	Miniature Piezoelectric Multilayer Actuators and their Applications (Review) W.A. Groen*, Delft University of Technology, Delft, The Netherlands, and TNO Holst Centre, Eindhoven, The Netherlands P. Pertsch, PI Ceramic GmbH, Lederhose, Germany
10:30 – 11:00		Coffee Break (Hall 4.1)
11:00 – 11:20	B3.1	Micro Ultrasonic Motor Using One Cubic Millimeter Stator T. Mashimo, Toyohashi University of Technology, Toyohashi-shi, Japan
11:20 – 11:40	B3.2	An Ultrasonic Motor Using Side-Push of Center-Attached Eyelets on an Octagonal Piezoelectric Plate B. Koc, Physik Instrumente (PI) GmbH & Co. KG, Karlsruhe, Germany
11:40 – 12:00	B3.3	Resonance Asymmetric Rectangular Pulse Drive of Piezoelectric Motors Y. Ma*, Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, Suzhou, China, and The Pennsylvania State University, University Park, USA H. Shekhani, The Pennsylvania State University, University Park, USA M. Choi, The Pennsylvania State University, State College, USA K. Uchino, The Pennsylvania State University, University Park, USA
12:00 – 12:20	B3.4	Module Stepping Piezoelectric Actuator – A Versatile Way of Micro-Positioning Actuation F. Barillot*, Cedrat Technologies SA, Meylan, France F. Dubois, Cedrat Technologies SA, Meylan, France C. Belly, Cedrat Technologies SA, Meylan, France T. Forrissier, Cedrat Technologies SA, Meylan, France A. Saulot, Laboratoire de Mécanique des Contacts et des Structures, Villeurbanne, France Y. Berthier, Laboratoire de Mécanique des Contacts et des Structures, Villeurbanne, France
12:20 – 14:20		Lunch Break (Hall 4.1)
15:20 – 15:40	B3.5	Muscle-Like Piezohydraulic Actuators for Robotic Grippers W. Zoels, Siemens AG, München, Germany I. Vittorias, Siemens AG, München, Germany G. Bachmaier, Siemens AG, München, Germany
15:40 – 16:00	B3.6	Topological In-Plane Polarized Actuation for Compact Adaptive Lenses with Aspherical Correction F. Lemke*, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany M. Stürmer, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany U. Wallrabe, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany M.C. Wapler, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany

Tuesday 14 June 2016, 14:00 – 16:20, Borgward Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

16:00 – 16:20	B3.7	Deformable Bimorph Mirrors for Adaptive Optics in Space Telescopes D. Alaluf*, Université Libre de Bruxelles, Brussels, Belgium R. Bastaits, Université Libre de Bruxelles, Brussels, Belgium G. Martic, Belgian Ceramic Research Centre, Mons, Belgium A. Preumont, Université Libre de Bruxelles, Brussels, Belgium
16:20 – 16:40	B3.8	Application of Combined Ultrasonic-Levitation-Magnetic-Actuators in Machine Guideways B. Denkena, Leibniz Universität Hannover, Garbsen, Germany J. Reiners*, Leibniz Universität Hannover, Garbsen, Germany J. Wallaschek, Leibniz Universität Hannover, Hannover, Germany J. Twiefel, Leibniz Universität Hannover, Hannover, Germany I. Ille, Leibniz Universität Hannover, Hannover, Germany
16:40 – 17:10	Coffee Break (Hall 4.1)	
17:10 – 17:30	B3.9	High Response Proportional Flow Control Valve Using Particle Excitation D. Hirooka, Kansai University, Suita-shi, Japan T. Yamguchi, Kansai University, Suita-shi, Japan N. Furushiro, Kansai University, Suita-shi, Japan K. Suzumori, Tokyo Institute of Technology, Tokyo, Japan T. Kanda, Okayama University, Okayama-shi, Japan
17:30 – 17:50	B3.10	Performance of a Novel Small Component Conveyer Utilizing Flexural Traveling Waves T. Wielert, Leibniz Universität Hannover, Hannover, Germany J. Twiefel, Leibniz Universität Hannover, Hannover, Germany I. Mešan, Afag GmbH, Amberg, Germany K. Bott, Afag GmbH, Amberg, Germany
19:30 – 22:30	Welcome Reception / Get-together (Foyer ÖVB Arena)	

Wednesday 15 June 2016, 9:30 – 12:40, Borgward Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session B6 Aerospace Applications

Session Chair F. Claeysen / P. Jänker

09:30 – 10:00	B6.0	Smart Structures: Recent Development within Aeronautics Applications (Invited Review) H.P. Monner, Deutsches Zentrum für Luft- und Raumfahrt (DLR), Braunschweig, Germany
10:30 – 11:00	Coffee Break (Hall 4.1)	
11:00 – 11:20	B6.1	Design Study and Performance Evaluation of Actuator System for Subsonic GA Wind Tunnel Testing N. Kobiki, JAXA, Mitaka-shi, Japan K. Saitoh, JAXA, Mitaka-shi, Japan Y. Hamada, JAXA, Mitaka-shi, Japan S.K. Chee, Mechano Transformer Corporation, Chiyoda-ku, Japan T. Yano, Mechano Transformer Corporation, Chiyoda-ku, Japan A. Yano, Mechano Transformer Corporation, Chiyoda-ku, Japan
11:20 – 11:40	B6.2	Pulsed Air High Performances Valves Improve Aerodynamic Flow Over Airplane Wings F. Claeysen*, Cedrat Technologies SA, Meylan, France C. Bouchet, Cedrat Technologies SA, Meylan, France M. Fournier, Cedrat Technologies SA, Meylan, France F. Ternoy, ONERA - Centre de Lille, Lille, France J. Danbois, ONERA, Meudon, France A. Choffat, ONERA - Centre de Lille, Lille, France
11:40 – 12:00	B6.3	Active Flow Control by a Scalable Actuation Principle of Shape Memory Alloys and Fiber Reinforced Polymers – Adaptive Vortex Generators as an Example M. Hübler, Institut für Verbundwerkstoffe GmbH, Kaiserslautern, Germany S. Nissle, Institut für Verbundwerkstoffe GmbH, Kaiserslautern, Germany M. Gurka, Institut für Verbundwerkstoffe GmbH, Kaiserslautern, Germany U. Breuer, Institut für Verbundwerkstoffe GmbH, Kaiserslautern, Germany J. Wassenaar, DG Flugzeugbau, Bruchsal, Germany
12:00 – 12:20	B6.4	New Rating Life Calculation for Rolling Elements on Aircraft T. Münzing, Universität Stuttgart, Stuttgart, Germany M. Bachmann, Universität Stuttgart, Stuttgart, Germany H. Binz, Universität Stuttgart, Stuttgart, Germany S. Seemann, Airbus Group Innovation, Ottobrunn, Germany M. Christmann, Airbus Group Innovation, Ottobrunn, Germany S. Toro, Umbra Cuscinetti S.p.A., Foligno, Italy
12:40 – 12:50	Closing Remarks (Hanse Saal)	
13:00 – 15:00	Lunch Break (Hall 4.1)	
15:00	End of Conference	

Monday 13 June 2016, 10:00–13:00, Focke Wulf Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session C1 Polymer Actuators

Session Chair A. Köllnberger / H.F. Schlaak

10:00 C1.0 **Elastomers for Dielectric Electroactive Polymer Applications** (Review)
– 10:30
Hanse Saal
A. Köllnberger*, Wacker Chemie AG, Burghausen, Germany
H.F. Schlaak, Technische Universität Darmstadt, Darmstadt, Germany

10:30–11:00 **Coffee Break (Hall 4.1)**

11:00 C1.1 **Customized Dielectric Elastomer Stack-Actuators Under Consideration of Application Specifications**
– 11:20
B. von Heckel, Hochschule Ostwestfalen-Lippe, Lemgo, Germany
T. Hoffstadt, Hochschule Ostwestfalen-Lippe, Lemgo, Germany
J. Maas, Hochschule Ostwestfalen-Lippe, Lemgo, Germany

11:20 C1.2 **A Compact High-Force Dielectric Elastomer Membrane Actuator**
– 11:40
S. Hau*, Universität des Saarlandes, Saarbrücken, Germany
A. York, Universität des Saarlandes, Saarbrücken, Germany
S. Seelecke, Universität des Saarlandes, Saarbrücken, Germany

11:40 C1.3 **Magneto-Active Polymer Actuator**
– 12:00
A. Diermeier*, Ostbayerische Technische Hochschule Regensburg, Regensburg, Germany
D. Sindersberger, Ostbayerische Technische Hochschule Regensburg, Regensburg, Germany
G. Monkman*, Ostbayerische Technische Hochschule Regensburg, Regensburg, Germany

12:00 C1.4 **Haptic Actuators Based on Magnetoactive Polymers**
– 12:20
H. Böse*, Fraunhofer ISC, Würzburg, Germany
J. Ehrlich, Fraunhofer ISC, Würzburg, Germany

12:20 C1.5 **Magneto-Rheological Elastomer Actuators for a Reconfigurable Joystick**
– 12:40
J. Bilz, Technische Universität Darmstadt, Darmstadt, Germany
H. Böse, Fraunhofer ISC, Würzburg, Germany
M. Kupnik, Technische Universität Darmstadt, Darmstadt, Germany
C. Hatzfeld, Technische Universität Darmstadt, Darmstadt, Germany

12:40 C1.6 **Plasticized-Polymer Actuators with Colossal Dielectric Constant – Electro-Mechanical & Electro-Optical Functions**
– 13:00
T. Hirai, Shinshu University, Ueda-shi, Japan,
and Autonomic Materials Institute, Ueda-shi, Japan

13:00–15:00 **Lunch Break (Hall 4.1)**

Monday 13 June 2016, 15:30–17:20, Focke Wulf Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session C2 Shape Memory Actuators

Session Chair A. Ludwig / G. Vergani

15:30 C2.0 **Recent Developments in Shape Memory Alloys**
– 16:00
Hanse Saal
(Invited Review)
H. Maier, Leibniz Universität Hannover, Garbsen, Germany

16:00 C2.1 **Advances in NiTi-Based SMA for Actuators**
– 16:20
A. Coda, SAES Getters S.p.A., Lainate, Italy
L. Fumagalli, SAES Getters S.p.A., Lainate, Italy

16:20 C2.2 **Industrial Safety Systems Using Shape Memory Alloy Actuators**
– 16:40
A. Czechowicz, Forschungsgemeinschaft Werkzeuge und Werkstoffe e.V., Remscheid, Germany
B. Rachor, HEMA Maschinen und Apparateschutz GmbH & Co. KG, Seligenstadt, Germany
F. Hoffmann, Forschungsgemeinschaft Werkzeuge und Werkstoffe e.V., Remscheid, Germany

16:40 C2.3 **Compact Bi-Stable SMA Actuator**
– 17:00
P. Motzki*, Universität des Saarlandes, Saarbrücken, Germany, and ZeMA gGmbH, Saarbrücken, Germany
S. Seelecke, Universität des Saarlandes, Saarbrücken, Germany, and ZeMA gGmbH, Saarbrücken, Germany

17:00 C2.4 **Analysis of Performance and Energy Efficiency of Thin Shape Memory Alloy Wire-Based Actuators**
– 17:20
H. Khan*, University of Dundee, Dundee, United Kingdom
A. Cuschieri, University of Dundee, Dundee, United Kingdom
L. Manfredi, University of Dundee, Dundee, United Kingdom

17:30–19:30 **Poster Session in the Foyer Hall 4.1**

Tuesday 14 June 2016, 10:00–12:20, Focke Wulf Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session C3 Micro Actuators / Micro Fluid Handling Devices

Session Chair

K. Hjort / J.C. Lötters

10:00 C3.0 Integrated Systems for the Accurate Measurement and Control of Micro Liquid and Gas Flows (Review)
– 10:30
Hanse Saal
J.C. Lötters, Bronkhorst High-Tech B.V., Ruurlo, The Netherlands, and University of Twente, Enschede, The Netherlands

10:30–11:00 Coffee Break (Hall 4.1)

11:00 C3.1 Resonant Three-Dimensional Electrostatic Actuator in Silicon Technology
– 11:20
B. Goj*, Technische Universität Ilmenau, Ilmenau, Germany
L. Dressler, Technische Universität Ilmenau, Ilmenau, Germany
L. Dittrich, Technische Universität Ilmenau, Ilmenau, Germany
M. Hoffmann, Technische Universität Ilmenau, Ilmenau, Germany

11:20 C3.2 Mono-Dispersed Droplets Generation in the Flowing Ambient Liquid by Using an Ultrasonic Vibrator
– 11:40
T. Kanda*, Okayama University, Okayama-shi, Japan
T. Yamada, Okayama University, Okayama-shi, Japan
K. Mori, Okayama University, Okayama-shi, Japan
K. Suzumori, Tokyo Institute of Technology, Tokyo, Japan

11:40 C3.3 Cost-Efficient Manufacturing of a High Deflection Electrothermal Drive for Switching Applications
– 12:00
M. El Khoury*, Technische Universität Darmstadt, Darmstadt, Germany
T. Winterstein, Technische Universität Darmstadt, Darmstadt, Germany
H.F. Schlaak, Technische Universität Darmstadt, Darmstadt, Germany

12:00 C3.4 SMA Shape-Memory Microvalves for Fluidic Systems
– 12:20
C. Megnin*, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany
H. Ossmer, Karlsruher Institut für Technologie, Karlsruhe, Germany
M. Gültig, Karlsruher Institut für Technologie, Karlsruhe, Germany
T. Hanemann, Karlsruher Institut für Technologie, Karlsruhe, Germany
M. Kohl, Karlsruher Institut für Technologie, Karlsruhe, Germany

12:20–14:20 Lunch Break (Hall 4.1)

Tuesday 14 June 2016, 14:20–16:40, Focke Wulf Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session C4 MRF Actuators

Session Chair

S.-B. Choi / J. Goldasz

14:20 C4.0 Automotive MR Actuators – State of Art (Review)
– 14:50
Hanse Saal
J. Goldasz, BWI Group, Kraków, Poland

15:20 C4.1 Controlling the Magnetorheological Effect Using Vibrations
– 15:40
E. Leroy*, CEA LIST, Gif-sur-Yvette, France
P.-H. Orefice, CEA LIST, Gif-sur-Yvette, France
L. Eck, CEA LIST, Gif-Sur-Yvette, France
M. Hafez, CEA LIST, Gif-Sur-Yvette, France

15:40 C4.2 Hybrid Magnetorheological Damper
– 16:00
M. Jackel*, Fraunhofer LBF, Darmstadt, Germany
J. Kloepfer, Fraunhofer LBF, Darmstadt, Germany
M. Matthias, Fraunhofer LBF, Darmstadt, Germany

16:00 C4.3 Energy-Efficient MRF-Based Clutches in Hybrid Powertrains
– 16:20
C. Hegger*, Hochschule Ostwestfalen-Lippe, Lemgo, Germany
J. Maas, Hochschule Ostwestfalen-Lippe, Lemgo, Germany

16:20 C4.4 Magnetorheological Actuator for Haptic Applications
– 16:40
M.E. Busse-Grawitz, maxon advanced robotics and systems, Giswil, Switzerland
R. Pittini, maxon motor ag, Sachseln, Switzerland
R. Waldvogel, maxon advanced robotics and systems, Giswil, Switzerland
D. Martin, maxon advanced robotics and systems, Giswil, Switzerland

16:40–17:10 Coffee Break (Hall 4.1)

Tuesday, 14 June 2016, 14:50–18:10, Focke Wulf Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session C5 Actuator Control

Session Chair J. Maas / S. Soetebier

14:50 – 15:20 Hanse Saal	C5.0	Combining Usability and Performance - What Smart Actuators Can Learn from Automatic Commissioning of Variable Speed Drives (Invited Review) A. Wahrburg, ABB AG, Ladenburg, Germany K. Listmann, ABB AG, Ladenburg, Germany
17:10 – 17:30	C5.1	Control of a Compact Electrodynamic Planar Actuator M. Stock*, Technische Universität Dresden, Dresden, Germany T. Bödrich, Technische Universität Dresden, Dresden, Germany J. Lienig, Technische Universität Dresden, Dresden, Germany
17:30 – 17:50	C5.2	Vector Control of a Travelling Wave Ultrasonic Motor: Application to Efficiency Improvement by Voltage Reduction F. Giraud*, Université Lille 1, Villeneuve d'Ascq, France C. Giraud-Audine, Arts et Métiers ParisTech, Lille, France M. Amberg, Université Lille 1, Villeneuve d'Ascq, France B. Lemaire-Semail, Université Lille 1, Villeneuve d'Ascq, France
17:50 – 18:10	C5.3	Power Electronics and Control Concepts for Driving Dielectric Elastomer Transducers T. Hoffstadt, Hochschule Ostwestfalen-Lippe, Lemgo, Germany J. Maas, Hochschule Ostwestfalen-Lippe, Lemgo, Germany
19:30–22:30		Welcome Reception / Get-together (Foyer ÖVB Arena)

Wednesday 15 June 2016, 10:00–12:40, Focke Wulf Saal

Please note that all reviews will be given in the plenum in the Hanse Saal!

Session C6 Low-Power Electromagnetic Actuators

Session Chair W. Amrhein / R. Keller

10:00 – 10:30 Hanse Saal	C6.0	Sensorless Control of Low-Power Electromagnetic Actuators (Invited Review) M. Nienhaus, Universität des Saarlandes, Saarbrücken, Germany
10:30–11:00		Coffee Break (Hall 4.1)
11:00 – 11:20	C6.1	A Novel Low-Power Dual-Actuator for High-Precision Magnetic Levitation Systems M. Lahdo*, Technische Hochschule Mittelhessen, Friedberg, Germany T. Ströhla, Technische Universität Ilmenau, Ilmenau, Germany S. Kovalev, Technische Hochschule Mittelhessen, Friedberg, Germany
11:20 – 11:40	C6.2	Planar Magnetic Levitation in 6 DOF R. Glöß, Physik Instrumente (PI) GmbH & Co. KG, Karlsruhe, Germany
11:40 – 12:00	C6.3	Torque Measurements on an Electromagnetic Tilting Actuator M. Dörbaum*, Leibniz Universität Hannover, Hannover, Germany T. Winkel, Leibniz Universität Hannover, Hannover, Germany S. Tappe, Leibniz Universität Hannover, Hannover, Germany J. Kotlarski, Leibniz Universität Hannover, Hannover, Germany T. Ortmaier, Leibniz Universität Hannover, Hannover, Germany B. Ponick, Leibniz Universität Hannover, Hannover, Germany
12:00 – 12:20	C6.4	An Exploratory Study of the Retardation Ability of a Thomson Coil Actuator G. Engdahl, KTH Royal Institute of Technology, Stockholm, Sweden J. Magnusson, KTH Royal Institute of Technology, Stockholm, Sweden A. Bissal, ABB Corporate Research, Västerås, Sweden M. Sparr, KTH Royal Institute of Technology, Stockholm, Sweden
12:20 – 12:40	C6.5	Miniaturisation Trends in Magnetic Gears G. Puchhammer, Karl Rejlek GmbH, Wien, Austria
12:40–12:50		Closing Remarks (Hanse Saal)
13:00–15:00		Lunch Break (Hall 4.1)
15:00		End of Conference



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Monday 13 June 2016, 17:30 – 19:30, Foyer Hall 4.1

“Piezoelectric Actuators”

- P 1 Longitudinal - Torsional Type Piezoelectric Actuator for the High Speed Rotational Motor**
Y. Yang, Nanjing University of Aeronautics and Astronautics, Nanjing, China
D. Mazeika, Vilnius Gediminas Technical University, Vilnius, Lithuania
P. Vasiljev, Lithuanian University of Educational Sciences, Vilnius, Lithuania
S. Borodinas, Lithuanian University of Educational Sciences, Vilnius, Lithuania
- P 2 The Investigation of Hollow Hemisphere-Shape Actuator**
P. Vasiljev, Lithuanian University of Educational Sciences, Vilnius, Lithuania
R. Bareikis, Lithuanian University of Educational Sciences, Vilnius, Lithuania
S. Borodinas, Lithuanian University of Educational Sciences, Vilnius, Lithuania
A. Struckas, Lithuanian University of Educational Sciences, Vilnius, Lithuania
J. Kasperoviciene, Nature Research Center, Vilnius, Lithuania
- P 3 Piezoelectric Nonlinearity and its Temperature Dependency Under High Power Driving**
S. Miyake, The University of Tokyo, Kashiwa-shi, Japan
T. Morita, The University of Tokyo, Kashiwa-shi, Japan
- P 4 Barium Titanate Thick Film Deposited by Ultrasonic-Assisted Hydrothermal Method**
R. Takayama, The University of Tokyo, Kashiwa-shi, Japan
T. Morita, The University of Tokyo, Kashiwa-shi, Japan
- P 5 Full Characterisation of PZT Actuators in Quasi-Static, Large Signal Operation at Elevated Temperature**
C. Mangeot*, Noliac A/S, Kvistgaard, Denmark
B. Andersen, Noliac A/S, Kvistgaard, Denmark
- P 6 Reliability Enhancement Through the Use of Fusing Technique**
C. Mangeot*, Noliac A/S, Kvistgaard, Denmark
- P 7 Resonance Frequency Tracking for Piezoelectric Devices**
S. Safour, Génie Electrique et Electronique de Paris, Gif-sur-Yvette, France, and Nexteer Automotive, Villepinte, France
Y. Bernard, Génie Electrique et Electronique de Paris, Gif-sur-Yvette, France
H. Bochmann, Hochschule Ostwestfalen-Lippe, Lemgo, Germany
- P 8 Nanometric Linear Piezo-Actuator with Integrated Strain Gages for High Stability Positioning**
F. Barillot*, Cedrat Technologies SA, Meylan, France
T. Porchez, Cedrat Technologies SA, Meylan, France
C. Belly, Cedrat Technologies SA, Meylan, France

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“Piezo Actuator Applications”

- P 9 Design and Optimization of a Piezo-Actuated Flapping Wing Mechanism for Micro Air Vehicles**
 Y. Peng*, National University of Singapore, Singapore
 J. Cao, National University of Singapore, Singapore, and Beijing Institute of Technology, Beijing, China
 L. Liu, National University of Singapore, Singapore
 J. Wang, Zhejiang University, Hangzhou, China
 H. Yu, National University of Singapore, Singapore
- P 10 Performance Evaluation of a Single-Stage Valve at High Temperatures Actuating by Piezoelectric Stack**
 C. Han, Inha University, Incheon, South Korea
 W.H. Kim, Inha University, Incheon, South Korea
 S.-B. Choi, Inha University, Incheon, South Korea
- P 11 Effective Vibration Mode of Ultrasonic Transducers for Low Flow Rate Spraying**
 S. Ofuji*, Okayama University, Okayama-shi, Japan
 S. Tsuyuki, Okayama University, Okayama-shi, Japan
 T. Kanda, Okayama University, Okayama-shi, Japan
 S. Miyake, Okayama University, Okayama-shi, Japan
 S.-I. Kawasaki, National Institute of Advanced Industrial Science and Technology, Sendai-shi, Japan
- P 12 A Two-Stage Piezoelectric Motor Based on the Principle of Strain Wave Gearing with High Torque Capabilities**
 Q. Guilleus*, CEA LIST, Gif-sur-Yvette, France
 M. Hafez, CEA LIST, Gif-sur-Yvette, France
 E. Leroy, CEA LIST, Gif-Sur-Yvette, France
- P 13 Acoustic Boosting of Battery Charging**
 S. Tietze*, Hochschule Coburg, Coburg, Germany
 G. Lindner, Hochschule Coburg, Coburg, Germany
- P 14 Design Optimization of Ultrasonic Motors Based on Power Flow Analysis**
 T. Yuan, The Pennsylvania State University, University Park, USA, and Shanghai University, Shanghai, China
 K. Uchino, The Pennsylvania State University, University Park, USA
 C. Li, Shanghai University, Shanghai, China
- P 15 Stator / Rotor Interface Analysis for Ultrasonic Motors**
 K. Harmouch, Génie Electrique et Electronique de Paris, Gif-sur-Yvette, France, and Faurecia Groupe, Bavans, France
 Y. Bernard, Génie Electrique et Electronique de Paris, Gif-sur-Yvette, France, and Université Paris Sud, Paris, France
 L. Daniel, Génie Electrique et Electronique de Paris, Gif-sur-Yvette, France, and Université Paris Sud, Paris, France
- P 16 Force Stepping Piezo Actuator: a Motorised Solution for High Resolution Positioning and External Forces Resistance**
 F. Barrilot*, Cedrat Technologies SA, Meylan, France
 C. Belly, Cedrat Technologies SA, Meylan, France

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“Microactuators / Micro Fluid Handling Devices”

- P 17 Dynamic Model of a PAD Actuator: Dynamic Operation and Pull-Off at High Speed**
 C. Giraud-Audine, Arts et Métiers ParisTec, Lille, France
 M. Amberg, Université Lille 1, Villeneuve d’Ascq, France
 F. Giraud, Université Lille 1, Villeneuve d’Ascq, France
 C. Mangeot, Noliac A/S, Kvistgaard, Denmark
- P 19 Microfluidic System for Water Sample Treatment**
 S. Gassmann*, Jade Hochschule, Wilhelmshaven, Germany
 H. Schütte, Jade Hochschule, Wilhelmshaven, Germany
 M.L. Miranda, Carl von Ossietzky-Universität Oldenburg, Wilhelmshaven, Germany
 O. Zielinski, Carl von Ossietzky-Universität Oldenburg, Wilhelmshaven, Germany
- P 20 A Fabrication of Electrostatic Actuated Rotational Microshutter Array**
 L. Oh, NASA Goddard Space Flight Center, Greenbelt, USA
 M. Li, NASA Goddard Space Flight Center, Greenbelt, USA
- P 21 Magnetoresistive Sensors for Angle, Position and Speed Measurement in Small and Micro Actuators**
 R. Slatter, Sensitec GmbH, Lahnau, Germany
 R. Buß, Sensitec GmbH, Lahnau, Germany
- “ERF / MRF Actuators”**
- P 23 New Class of Trunk-Like Robots: Structure, Control, Actuators**
 R. Bansevicius*, Kaunas University of Technology, Kaunas, Lithuania
 A. Drukteinienė, Siauliai University, Siauliai, Lithuania
 G. Kulvietis, Vilnius Gediminas Technical University, Vilnius, Lithuania
 V. Jurenas, Kaunas University of Technology, Kaunas, Lithuania

“Low-Power Electromagnetic Actuators”

- P 24 FlexPCB Windings, the Way Towards Very High Performance Coreless BLDC Motors**
 F. Baudart*, Université Catholique de Louvain, Louvain-la-Neuve, Belgium
 B. Dehez, Université Catholique de Louvain, Louvain-la-Neuve, Belgium
- P 25 A High Precision Single Stage Compound Epicyclic Friction Speed Reducer**
 J. Schorsch, Delft University of Technology, Delft, The Netherlands
 F. van der Helm, Delft University of Technology, Delft, The Netherlands
 D. Abbink, Delft University of Technology, Delft, The Netherlands
- P 26 Compact Electrodynamic Planar Actuator for Automation**
 T. Bödrich*, Technische Universität Dresden, Dresden, Germany
 B. Rosul, Technische Universität Dresden, Dresden, Germany
 M. Stock, Technische Universität Dresden, Dresden, Germany
 J. Ziske, Technische Universität Dresden, Dresden, Germany
 J. Lienig, Technische Universität Dresden, Dresden, Germany

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- P 27 Highly Integrated Linear Direct Drive for Short Strokes**
 J. Ziske*, Technische Universität Dresden, Dresden, Germany
 T. Bödrich, Technische Universität Dresden, Dresden, Germany
 H. Basler, Technische Universität Dresden, Dresden, Germany
 Q. Sun, Technische Universität Dresden, Dresden, Germany
 J. Lienig, Technische Universität Dresden, Dresden, Germany

“Polymer Actuators”

- P 28 Development of an Artificial Muscle from Coiled Polymer Fibers for Humanoid Robotics Applications**
 A. Kalysheva, Nazarbayev University, Astana, Kazakhstan
 Z. Zhapar, Nazarbayev University, Astana, Kazakhstan
 K. Tulkibayeva, Nazarbayev University, Astana, Kazakhstan
 M. Folgheraiter, Nazarbayev University, Astana, Kazakhstan
- P 29 Polymer-Dispersed Liquid Crystal Elastomer Thermomechanical Actuator**
 A. Rešetič*, Jožef Stefan Institute, Ljubljana, Slovenia, and Jožef Stefan International Postgraduate School, Ljubljana, Slovenia
 J. Milavec, Jožef Stefan Institute, Ljubljana, Slovenia
 B. Zupančič, Jožef Stefan Institute, Ljubljana, Slovenia
 V. Domenici, Università degli Studi di Pisa, Pisa, Italy
 B. Zalar, Jožef Stefan Institute, Ljubljana, Slovenia, and Jožef Stefan International Postgraduate School, Ljubljana, Slovenia
- P 30 Development and Experimental Characterization of a DE Membrane Actuated Valve**
 M. Hill*, Universität des Saarlandes, Saarbrücken, Germany
 A. York, Universität des Saarlandes, Saarbrücken, Germany
 S. Seelecke, Universität des Saarlandes, Saarbrücken, Germany
- P 31 Polymeric Muscle for Nanopositioning with Electronic Control System**
 L.L. Valero Conzuelo, Universidad Autonoma del Estado de Mexico, Toluca, Mexico, and Universidad Politécnica de Cartagena, Cartagena, Spain
 T. Fernández Otero, Universidad Politécnica de Cartagena, Cartagena, Spain
 E. Rodríguez Angeles, Universidad Autonoma del Estado de Mexico, Toluca, Mexico
 O. Rosas Jaimés, Universidad Autonoma del Estado de Mexico, Toluca, Mexico
- P 32 Design of Control Strategies for a Novel Actuator System with Dielectric Electroactive Polymer and Spring**
 X. Zhang, Robert Bosch GmbH, Renningen, Germany
 A. Verhagen, Robert Bosch GmbH, Renningen, Germany
 Q. Zhu, Karlsruher Institut für Technologie, Karlsruhe, Germany
 S. Hau, Universität des Saarlandes, Saarbrücken, Germany
 S. Seelecke, Universität des Saarlandes, Saarbrücken, Germany

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“Shape Memory Actuators”

- P 33 Industry 4.0 Using Shape Memory Actuators - Opportunities and Challenges**
 A. Czechowicz, Forschungsgemeinschaft Werkzeuge und Werkstoffe e.V., Remscheid, Germany
 R. Theiß, Forschungsgemeinschaft Werkzeuge und Werkstoffe e.V., Remscheid, Germany
 P. Dültgen, Forschungsgemeinschaft Werkzeuge und Werkstoffe e.V., Remscheid, Germany
- P 34 Reconfigurable SMA End-Effector for Material Handling**
 P. Motzki*, Universität des Saarlandes, Saarbrücken, Germany, and ZeMA gGmbH, Saarbrücken, Germany
 Y. Goergen, Universität des Saarlandes, Saarbrücken, Germany, and ZeMA gGmbH, Saarbrücken, Germany
 A. York, Universität des Saarlandes, Saarbrücken, Germany
 S. Seelecke, Universität des Saarlandes, Saarbrücken, Germany, and ZeMA gGmbH, Saarbrücken, Germany
- P 35 Energy-Efficient SMA Vacuum Gripper System**
 P. Motzki*, Universität des Saarlandes, Saarbrücken, Germany, and ZeMA gGmbH, Saarbrücken, Germany
 J. Kunze, Universität des Saarlandes, Saarbrücken, Germany, and ZeMA gGmbH, Saarbrücken, Germany
 A. York, Universität des Saarlandes, Saarbrücken, Germany
 S. Seelecke, Universität des Saarlandes, Saarbrücken, Germany, and ZeMA gGmbH, Saarbrücken, Germany
- P 59 Influence of Thermal Cycling on the Phase Transformation Temperatures and Latent Heat of a NiTi Shape Memory Alloy**
 E. da Silva, University of Brasília, Brasília, Brazil
 T.S. da Nóbrega Guenka, University of Brasília, Brasília, Brazil
 R.S. Rochas, University of Brasília, Brasília, Brazil
 T.C. da Silva, University of Brasília, Brasília, Brazil

“Actuator Control”

- P 36 Passive Speed Control Using Functional Clutch Driven Reversely**
 K. Koyanagi*, Toyama Prefectural University, Imizu-shi, Japan
 Y. Kimura, Osaka University Hospital, Suita-shi, Japan
 M. Koyanagi, Osaka Electro-Communication University, Shijonawate-shi, Japan
 A. Inoue, ER-tec Co., Minoh-shi, Japan
 T. Motoyoshi, Toyama Prefectural University, Imizu-shi, Japan
 H. Masuta, Toyama Prefectural University, Imizu-shi, Japan
 P. Oshima, Toyama Prefectural University, Imizu-shi, Japan
- P 37 Noise-Robust Online Parameter Identification of BLAC Machines Using Sliding Mode Differentiator**
 N. König*, Universität des Saarlandes, Saarbrücken, Germany
 E. Grasso, Universität des Saarlandes, Saarbrücken, Germany
 D. Merl, Universität des Saarlandes, Saarbrücken, Germany
 M. Nienhaus, Universität des Saarlandes, Saarbrücken, Germany

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- P 38 A Direct Flux Observer for Robust to Noise Sensorless Control of PMSMs**
E. Grasso*, Universität des Saarlandes, Saarbrücken, Germany
M. Nienhaus, Universität des Saarlandes, Saarbrücken, Germany

“Active Vibration / Active Noise Control”

- P 40 Vibration Damping with SMA / PZT / Si Heterostructures**
N. Choudhary, University of North Texas, Texas, USA
K. Singh, Indian Institute of Technology Roorkee, Roorkee, India
D. Kaur*, Indian Institute of Technology Roorkee, Roorkee, India

- P 41 Semi-Passive Vibration Control Technique via Shunting of Amplified Piezoelectric Actuators**
F. Claeysen, Cedrat Technologies SA, Meylan, France
G. Mikulowski, Institute of Fundamental Technological Research, Polish Academy of Sciences, Warsaw, Poland
M. Fournier, Cedrat Technologies SA, Meylan, France
T. Porchez, Cedrat Technologies SA, Meylan, France
C. Belly, Cedrat Technologies SA, Meylan, France

“Aerospace Applications”

- P 42 Potentialities of APA Composite Shell Actuators and SA75D Amplifier for New Faster Dynamic Applications**
J.-L. Petiniot, ONERA - Center of Lille, Lille, France
M. Fournier, Cedrat Technologies SA, Meylan, France
M. Ragonet, ONERA - Center of Lille, Lille, France

- P 43 Embedded and Redundant Heater for Controlling of SMA-Based Rotary Actuator for Space Applications**
F. Stortiero, Technosprings Italia srl, Besnate, Italy
V. Visentin, Technosprings Italia srl, Besnate, Italy
S. Gualandris, Technosprings Italia srl, Besnate, Italy

“Fluidic / Pneumatic Actuators”

- P 44 Hydraulic Expansion Actuators for Ball Screws – Towards Applicable Preload Adaption**
B. Denkena, Leibniz Universität Hannover, Garbsen, Germany
P. Schreiber, Leibniz Universität Hannover, Garbsen, Germany

- P 45 A Multi-Functional Pneumatic Artificial Muscle – Proof of Concept**
T. Hassan*, Scuola Superiore Sant’Anna, Pontedera, Italy
M. Cianchetti, Scuola Superiore Sant’Anna, Pontedera, Italy
B. Mazzolai, Istituto Italiano di Tecnologia, Pontedera, Italy
C. Laschi, Scuola Superiore Sant’Anna, Pontedera, Italy
P. Dario, Scuola Superiore Sant’Anna, Pontedera, Italy

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- P 46 Pneumatic Actuator Using Polyimide Film for Liquid Nitrogen Temperature**
D. Yamaguchi, Saitama University, Saitama-shi, Japan
T. Hanaki, Saitama University, Saitama-shi, Japan
R. Kamimura, Saitama University, Saitama-shi, Japan
Y. Ishino, Saitama University, Saitama-shi, Japan
M. Hara, Saitama University, Saitama-shi, Japan
M. Takasaki, Saitama University, Saitama-shi, Japan
T. Mizuni, Saitama University, Saitama-shi, Japan

- P 47 Surveying and Closed-Loop Control Study of Highly Elastic Bending Actuator for Biomimetic Gripping**
J. Isermann*, Helmut Schmidt Universität, Hamburg, Germany
S. Ulrich, Helmut Schmidt Universität, Hamburg, Germany
R. Bruns, Helmut Schmidt Universität, Hamburg, Germany

“Haptic / Tactile Applications”

- P 48 Dtact: A Tactile Device Which Changes How a Surface is Perceived**
F. Giraud*, Université Lille 1, Villeneuve d’Ascq, France
C. Giraud-Audine, Arts et Métiers Paris Tech, Lille, France
M. Amberg, Université Lille 1, Villeneuve d’Ascq, France
B. Lemaire-Semail, Université Lille 1, Villeneuve d’Ascq, France

- P 49 Novel Radial Locking Actuator with Magnetoactive Polymer**
H. Böse*, Fraunhofer ISC, Würzburg, Germany
T. Gerlach, Fraunhofer ISC, Würzburg, Germany
J. Ehrlich, Fraunhofer ISC, Würzburg, Germany

“Magnetostrictive / MSM Actuators”

- P 50 Reduced Substrate Clamping Effect and Evidence of Shape Memory Behaviour in Vertically Aligned Ni-Mn-In Ultra Thin Films**
K. Singh, Indian Institute of Technology Roorkee, Roorkee, India
D. Kaur*, Indian Institute of Technology Roorkee, Roorkee, India

- P 51 Thickness Dependent Crossover from Strain-to-Charge Mediated Interface Coupling in Magnetic Shape Memory Alloys (MSMA) Based Thin Film Multiferroic Heterostructures**
K. Singh, Indian Institute of Technology Roorkee, Roorkee, India
D. Kaur*, Indian Institute of Technology Roorkee, Roorkee, India

- P 52 Multistable Pneumatic Valve Based on Magnetic Shape Memory Alloys**
T. Schiepp, ETO MAGNETIC, Stockach, Germany
L. Riccardi, ETO MAGNETIC, Stockach, Germany
R. Schnetzler, ETO MAGNETIC, Stockach, Germany
M. Laufenberg, ETO MAGNETIC, Stockach, Germany

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- P 53 Internal Stress Effects on Sputtered Giant Magnetostrictive Thin Films**
 S. Sakano*, Tokai University, Hiratsuka-shi, Japan
 R. Toyoda, Tokai University, Hiratsuka-shi, Japan
 A.A. Y Mansi, Tokai University, Hiratsuka-shi, Japan
 T. Washihira, Tokai University, Hiratsuka-shi, Japan
 Y. Matsumura, Tokai University, Hiratsuka-shi, Japan
- P 54 Optimization of Cutting Processes for Magnetic Shape Memory Actuator Elements**
 A. Böhm, Fraunhofer IWU, Dresden, Germany
 J. Schneider, Fraunhofer IWU, Chemnitz, Germany
 W.-G. Drossel, Fraunhofer IWU, Chemnitz, Germany
 E. Pagounis, ETO MAGNETIC GmbH, Stockach, Germany
 M. Laufenberg, ETO MAGNETIC GmbH, Stockach, Germany
- P 55 Internal Stress Control for Magnetostrictive Thin Films by Substrate Bias**
 S. Miyata, Tokai University, Hiratsuka-shi, Japan
 R. Toyoda, Tokai University, Hiratsuka-shi, Japan
 Y. Matsumura, Tokai University, Hiratsuka-shi, Japan

“(Bio-) Medical Applications”

- P 56 Development of a Hand Rehabilitation Robot System for Range of Motion Exercises with Pneumatic Soft Actuators**
 H. Taniguchi, National Institute of Technology, Tsuyama College, Tsuyama-shi, Japan
 T. Meguro, National Institute of Technology, Tsuyama College, Tsuyama-shi, Japan
 S. Yamamoto, National Institute of Technology, Tsuyama-shi, Japan
 S. Araki, National Institute of Technology, Tsuyama-shi, Japan
 R. Kobiki, National Institute of Technology, Tsuyama-shi, Japan
- P 57 Design of a Balancing Device for Small High Speed Rotors**
 D. Pfeffer*, Technische Universität Darmstadt, Darmstadt, Germany
 F. Klug, Technische Universität Darmstadt, Darmstadt, Germany
 H.F. Schlaak, Technische Universität Darmstadt, Darmstadt, Germany
 P.P. Pott, Technische Universität Darmstadt, Darmstadt, Germany
- P 58 MRI-Compatible Piezoelectric Actuator**
 Y. Bernard*, Université Paris Sud, Gif-sur-Yvette, France
- P 59 see p. 35f**

A

- Aaltio, I., Aalto University, Espoo, Finland A 3.8
 Abbink, D., Delft University of Technology, Delft, The Netherlands P 25
 Acosta, M., Technische Universität Darmstadt, Darmstadt, Germany A 1.1
 Alaluf, D., Université Libre de Bruxelles, Brussels, Belgium B 3.7
 Allevalo, G., Technische Universität Darmstadt, Darmstadt, Germany B 1.3
 Amberg, M., Université Lille 1, Villeneuve d'Ascq, France C 5.2, P 17, P 48
 Andersen, B., Noliac A/S, Kvistgaard, Denmark P 5
 Araki, S., National Institute of Technology, Tsuyama-shi, Japan P 56
 Ayvazov, K., Fraunhofer IPA, Mannheim, Germany B 1.1

B

- Bachmaier, G., Siemens AG, München, Germany B 3.5
 Bachmann, M., Universität Stuttgart, Stuttgart, Germany B 6.4
 Bansal, A., The Pennsylvania State University, University Park, USA A 1.3
 Bansevicius, R., Kaunas University of Technology, Kaunas, Lithuania P 23
 Bareikis, R., Lithuanian University of Educational Sciences, Vilnius, Lithuania P 2
 Barillot, F., Cedrat Technologies SA, Meylan, France A 1.9, B 3.4, P 8, P 16
 Bartenschlager, M., Technische Universität Darmstadt, Darmstadt, Germany B 1.3
 Basler, H., Technische Universität Dresden, Dresden, Germany P 27
 Bastais, R., Université Libre de Bruxelles, Brussels, Belgium B 3.7
 Baudart, F., Université Catholique de Louvain, Louvain-la-Neuve, Belgium P 24
 Belly, C., Cedrat Technologies SA, Meylan, France B 3.4, P 8, P 16, P 41
 Benichou, I., Technion – Israel Institute of Technology, Haifa, Israel A 3.2
 Bernard, Y., Université Paris Sud, Gif-sur-Yvette, France P 58
 Bernard, Y., Génie Electrique et Electronique de Paris, Gif-sur-Yvette, France P 7
 Bernard, Y., Génie Electrique et Electronique de Paris, Gif-sur-Yvette, France, and Université Paris Sud, Paris, France P 15
 Berthier, Y., Laboratoire de Mécanique des Contacts et des Structures, Villeurbanne, France B 3.4
 Bilz, J., Technische Universität Darmstadt, Darmstadt, Germany C 1.5
 Binz, H., Universität Stuttgart, Stuttgart, Germany B 6.4
 Bissal, A., ABB Corporate Research, Västerås, Sweden C 6.4
 Bochmann, H., Hochschule Ostwestfalen-Lippe, Lemgo, Germany B 2.4
 Bödrich, T., Technische Universität Dresden, Dresden, Germany C 5.1, P 26, P 27
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 Borghesan, G., Katholieke Universiteit Leuven, Leuven, Belgium B 2.2
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2 Training sessions on June 16th at ACTUATOR 2016

» Piezoelectric actuators

Mr. Francois BARILLOT

» Linear magnetic actuators

Mr. Patrick MENEROUD

Piezoelectric Actuators *Introductory course*

Basic knowledges

- Basics on piezoelectric materials bulk and MLA
- Piezo materials for actuators
- Constitutive laws / Equivalent electric circuit

Review of piezoelectric actuators

- Review of direct and amplified piezoelectric actuators
- Piezo mechanisms
- Exercises

Review of piezoelectric motors

- Piezoelectric motors
- Resonant structure
- Tribology of piezoelectric motors

Practises

Linear magnetic Actuators *Introductory course*

Basics of magnetism for actuators

- Magnetic effects & laws
- Magnetic forces
- Magnetic materials

Linear magnetic actuators

- The different kinds of linear actuators
- Design & performance of:
 - Moving coil actuators
 - Moving magnet actuators
 - Moving iron actuators
- Introduction to other magnetic actuators: MRF ...

Practises

Contact / Registration

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Venue

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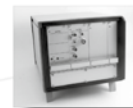
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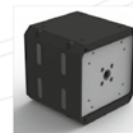


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9th International Exhibition on Smart Actuators and Drive Systems

The International Exhibition on Smart Actuators and Drive Systems will take place simultaneously with the conference in Hall 4.1 adjacent to the Congress Center. The exhibition will present components, system approaches and applications of smart actuators and low-power electromagnetic drives based on conventional (electromagnetic) and innovative working principles (new actuators) and associated subjects. The range of topics also includes measurement techniques, control concepts and circuits, driver components and units, system integration, layout and simulation tools etc.

On a total area of 2.300 m², exhibitors can use their own stand equipment or make use of the complete stand service offered by the organiser.

By 15 February 2016, 18 exhibitors have already registered.

Charges

► Exhibition space (raw space)

Row stand	Corner stand	Head stand
EUR 180/m ²	EUR 200/m ²	EUR 220/m ²

► System stands (excluding area)

Basic	Promo	Norma	Syma
EUR 115/m ²	EUR 185/m ²	EUR 169.50/m ²	EUR 195/m ²

All prices quoted plus VAT (19 percent at present).

A detailed information package will be mailed on request.

Exhibition Forum

In the exhibition area there will be an additional "Exhibition Forum", where exhibitors will give application-oriented presentations related to actuator relevant topics like

- actuator components
- system approaches
- applications of smart actuators and low-power electromagnetic drives

A regularly updated list of exhibitors as well as the programme of the Exhibition Forum will be available on the event homepage soon.

There will be no entrance fee for the exhibition. Visitors are welcome. Registration is requested until 6 April 2016. A list of exhibitors including detailed information about every exhibitor will be published in the conference proceedings.

A separate updated catalogue will be available in the exhibition.

The exhibition will take place at the

Bremen Exhibition Center

Hall 4.1

Bürgerweide

28209 Bremen

Germany

The Exhibition Center is directly connected to the Congress Center.

Opening Hours of the Exhibition

Monday 13 June 2016	9:00–19:30
Tuesday 14 June 2016	9:00–18:00
Wednesday 15 June 2016	9:00–15:00

(updated 18 February 2016)

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Conference Venue

The conference will be held in the Hanse Saal, the Borgward Saal and the Focke Wulf Saal of the Congress Center Bremen (CCB) on

Monday 13 June	8:45–19:30
Tuesday 14 June	9:00–18:10
Wednesday 15 June	9:00–15:00

The Poster Session will be held in the foyer of hall 4.1 on

Monday 13 June	17:30–19:30
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Exhibition

Parallel to the conference the 9th International Exhibition on Smart Actuators and Drive Systems will take place in hall 4.1 of the Exhibition Center Bremen, directly linked to the Congress Center Bremen.

Conference Language

The conference language is English.

Lunch and Refreshments

Lunch and refreshments are included in the conference fee. Opening times for lunch as follows.

Monday 13 June	13:00–15:00
Tuesday 14 June	12:20–14:20
Wednesday 15 June	13:00–15:00

Welcome Reception

Conference participants and exhibitors are invited to a Welcome Reception and Get together in the Foyer of the ÖVB Arena Bremen on Tuesday 14 June 2016 at 19:30.

Conference Documents

Upon registration you will receive

- ▶ Name Badge
- ▶ Conference Proceedings on CD Rom/USB Card
- ▶ List of Participants
- ▶ Exhibition Catalogue
- ▶ Programme Changes

A printed version of the Conference Proceedings is available at a subscription price of EUR 50 (plus 7 per cent VAT) **if ordered by 30 April 2016** together with a conference registration.

Registration

Registration is requested before 31 May 2016.
Please use the Online Registration Service.

Registration fees

For registration until 31 March 2016	EUR 720.00
For registration from 1 April 2016	EUR 820.00
One-day ticket	EUR 410.00

Reduced fee (Students, one author per paper or poster, one representative per exhibition stand)	EUR 410.00
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Reduced fee for members of the endorsers' group (registration to be accompanied by proof of membership) All prices plus additional VAT (19% at present).	EUR 720.00
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The reduced fee for students is only available if the registration is accompanied by a copy/scan of the corresponding student ID sent by e-mail to actuator@messe-bremen.de.

Conference fees include conference proceedings (digital version), entry to the exhibition, lunches, and refreshments. Technical visits and welcome reception are included, if having registered for the respective day.

Special Note for Authors

Authors intending to make use of the "reduced fee for authors" are kindly asked to register online stating the conference contribution. The validity will be verified. Deadline: 31 March 2016.

We expect at least one of the authors to participate in the conference. In case that none of the scheduled authors is present during the event, one of them will be charged the reduced conference fee. The Conference Proceedings will be sent by mail on request after the event.

Payment/Cancellation

Payment for registration is required in advance to the conference. Please make use of our Online Registration Service starting in February 2016. For this service, a valid credit card or a bank account is required. After 20 May 2016, we only accept payment by credit card.

Those who select payment on account are kindly asked to remit the conference fee after receipt of invoice. Payment may be made by bank transfer always stating "ACTUATOR 2016", the name of the participant and the invoice no. If we have not received the payment at the moment of the registration we will charge you on-site. Credit cards are accepted on-site also.

In case of cancellation received before or on 13 May 2016, the paid fee minus a service charge of EUR 40 (+VAT) will be refunded. There will be no refund in case of cancellation after 13 May 2016. In this case, the Conference Proceedings will be sent by mail after the event. Of course, substitutes are welcome, even on-site.

Personal Data

All data given will be kept confidential. MESSE BREMEN hereby notifies that contact details given during acceptance of submissions or registration will be stored and used for the organisation of ACTUATOR events only. Providing the data is optional in general, but mandatory for the acceptance of submissions / registrations. Authors' and delegates' addresses will not be published in full detail or passed to third parties for other purposes. After the expiry of the retention period the personal data will be deleted.

At any time, all authors and delegates may contradict the storage and further use of their data by the organiser for future activities. Parties who want to do so are kindly asked to send an e-mail to actuator@messe-bremen.de.

Photos and Video Clips

During the event Messe Bremen will take photos and video clips showing the event activities, participants, trade show visitors, exhibition stands, and exhibits. The team will ask for your written agreement. This material may be used free of charge for publication purposes in media and in public relation material related to ACTUATOR events edited by the organiser in consideration of the Law on Copyright and Neighbouring Rights in Arts. In case you do not accept this code of practise, please contact the photographer / film team or the organisation team at the entries and exits. You may also send an e-mail to actuator@messe-bremen.de.

Please note: Participants are not allowed to take photos of the presented slides or posters without the authors' permission. We intend to offer the presentation slides approved for download by the speakers about three weeks after the event. Please respect the authors' copyright!

Conference Information



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Homepage: www.actuator.de

Conference Office

The conference office will only be reachable during ACTUATOR 2016 as follows

Sunday 12 June	14:00–20:00
Monday 13 June	7:00–19:30
Tuesday 14 June	8:00–19:00
Wednesday 15 June	8:00–18:00

Salon Scharoun

Phone: +49 (0) 421 37 89 -706
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Accommodation

We have arranged a limited contingent of rooms at special rates with various hotels in Bremen. Therefore an early booking by 13 May 2016 at the latest is recommended.

For reservation purposes please use the Hotel Booking form at www.actuator.de or contact the Bremen Tourism Board directly:

Bremer Touristik Zentrale

Contact: Ms Karen Rink
Phone: +49 (0) 421 30 8 00 -19
Fax: +49 (0) 421 30 8 00 -3819
E-mail: rink@bremen-tourism.de



from 13–15 June 2016

► Drop Tower Bremen

A Drop Tower tour consists of a generally understandable presentation of the institute and its work. Afterwards you can have a look at our facilities especially the integration hall and the control centre. Visitors groups are not allowed to go to the top of the Drop Tower for internal reasons until further notice.

The visit will take place on Monday, 13 June 2016 from 16:00–17:30
Meeting point is the check-in desk at 15:30, departure is at 15:40

► Mercedes Benz Factory Tour

Discover what makes Mercedes-Benz cars so remarkable and see for yourself how a Mercedes is built! Find out what makes Mercedes-Benz cars so special and take a look behind the scenes at one of the most modern automotive factories in the world, witnessing the genesis of the SL, SLK, C-Class, E-Class Coupé and the all-terrain GLK.

The visit will take place on Tuesday, 14 June 2016 from 15:30–17:30
Meeting point is the check-in desk at 14:50, departure is at 15:00

► Astrium Aereospace Tour

Bremen is one of Europe's leading centres for space travel. The European contribution to the International Space Station (ISS), for example, was assembled at Astrium. The ISS is in orbit some 400 kilometres above Earth, so delivering supplies is a real challenge for engineers. How does water and food get to the astronauts? How do people live, sleep, and carry out research in zero gravity? Answers to these and other questions are provided in a replica of the Columbus module. You can also see parts being constructed for the Ariane 5 rocket that launches satellites into orbit, and find out how much a litre of milk weighs on the surface of the moon.

The visit will take place on Wednesday, 15 June 2016 from 11:30–13:30
Meeting point is the check-in desk at 10:45, departure is at 11:00

The costs of all visits are included in the registration fee. Transport to all locations will be organised. Registration is only possible on-site at the conference check-in.

We would like to draw your attention to events accompanying ACTUATOR 2016 held in the Congress Center Bremen (CCB) at the same time, organised by external organisers:

► **BMBF Technology Talk**

**“Intelligente Werkstoffe für innovative Produkte
(Smart Materials for Innovative Products)”**

in German language in the Lloyd Hall of the CCB,
10:00–16:00, on 14 June 2016

Please note: This event is organised by VDI Technologiezentrum GmbH, Düsseldorf, Germany, on behalf of the German Federal Ministry of Education and Research (BMBF), on their own account.*

► **Training Sessions “Piezoelectric Actuators”
and “Magnetic Linear Actuators”**

9:00–17:00, on 16 June 2016

For details please see p. 42ff.

Please note: These Training Sessions are organised by Cedrat Technologies SA, Meylan, France, on their own account.*

*MESSE BREMEN does not take any responsibility for these events.

Exhibition and Congress Center Bremen

Bürgerweide
28209 Bremen
Germany

or (for navigation systems)

Theodor-Heuss-Allee 21–23
28215 Bremen
Germany

During the event: 12–15 June 2016
Phone: +49 (0) 421 37 89-706
Fax: +49 (0) 421 35 05-387

Public Transport to the Exhibition and Congress Center Bremen**From Airport Bremen**

Take tram no. 6 direction University and leave at station Messe Centrum/ Blumenthalstraße. Walk along the small park in front of you and you will see the Exhibition and Congress Center Bremen.

From Hauptbahnhof (main station)

A 5 minute walk takes you from the main station to the venue. Use the north exit to Bürgerweide/MESSE CENTRUM. You will see the venue just beyond the parking area.

By car

Follow the signs ÖVB Arena/MESSE/CCB. Parking space is available at the Bürgerweide, just between the main station and the Exhibition and Congress Center Bremen. Maps can be downloaded from www.messe-bremen.de

Location Map

