

Practical information

The workshop requires prior registration. Registration information can be found on the workshop homepage.

Price: 60 € for academic participants / 120 € for industry participants.

Sandwiches and refreshments are included in the workshop registration fee.

Company sponsorships – stalls – donations are welcome. Please contact UP Transfer GmbH for further information: info@up-transfer.de and +49(0331)977-1384.

A sponsorship flyer is available via the IEEE-ICSD 2010 conference homepage www.ICSD2010.com

Please check regularly with the workshop homepage for further information: canopus.physik.uni-potsdam.de/DEA2010 (or use tinyurl.com/DEA2010)

The local administration is handled jointly by the group of Prof. Dr. Reimund Gerhard and UP Transfer. Dr. Guggi Kofod acknowledges support from BMBF-WING grant no. 03X5511.



The workshop is co-located with the 2010 IEEE-ICSD Conference in Potsdam (4th – 9th July, 2010).
Conference website: www.ICSD2010.com

Organized by

Dr. Guggi Kofod (University of Potsdam)
and

Dr. Gabor Kovacs (EMPA, Switzerland)

This event is affiliated with “European Scientific Network for Artificial Muscles”



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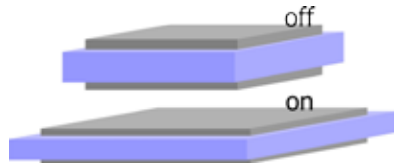


**Dielectric elastomer
actuators –
Enabling applications**



European workshop
in Potsdam, Germany

July 4th, 2010

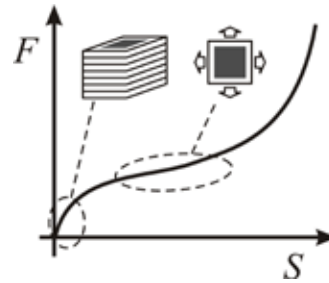


Background: Dielectric elastomer actuators can undergo large and fast actuation under application of a voltage. The effect can be found in any soft solid dielectric; so far attention has been focussed on gels and elastomers. The major obstacles for most applications are found in the relatively high operating voltages (> 1-2 kV) and in problems with reliability. Workers are seeking to solve these problems with improved materials and processing.

Workshop: The aim is to bring together leaders in dielectric elastomer actuator research and application. The main problems and possible solutions will be identified via open discussions. Participants will learn about and discuss how to:

- » obtain high actuation strain with high efficiency, low voltage, practical reaction time and precise control.
- » combine low operating voltage, high breakdown strength, high dielectric permittivity, very low elastic modulus, good compliant electrodes, and excellent mechanical and electrical durability in one and the same soft dielectric material system.

Format: The workshop will be organised as a morning and an afternoon session. Each session will begin with a series of talks, followed by an open-floor discussion.



Morning – Voltage, optimized actuation, driving and control systems

We will discuss immediate issues concerning applications of dielectric elastomer actuators. A number of issues are known which often lead end users (industry) to reject the technology all together. In this session, we will define the main issues, and discuss how with a materials research effort combined with proper manufacturing and suitable electronics, these actuators can find mainstream usage.

- » low voltage actuation (<1kV)
- » feasible actuation strains
- » actuation frequency (reaction time) limitation
- » actuation under variable temperature
- » practical measures of efficiency
- » control systems
- » energy harvesting

A discussion of how new materials can be properly and accurately investigated for DEA applications (standardized procedure) will also take place.

Afternoon – Lifetime, reliability, fault tolerance and fatigue mechanisms

Experiments have shown that millions of actuation cycles can be achieved with dielectric elastomer actuators. What are the conditions to achieve this reliability? Some applications would require only a few cycles, while others would require billions of cycles under varying ambient conditions. Can actuator reliability ever aspire to meet such requirements?

- » lifetime
- » mechanical fatigue
- » electrical aging
- » failure mechanism identification
- » leading failure mechanisms
- » quality assessment of dielectric films
- » self-healing / self-clearing

Questions of process technology and corresponding costs will be discussed.

The invited lecturers and the detailed time schedule will be announced later.