

April 18, 2008

Elektroactive Polymers (EAP) for Smart Structures

Dr. Silvain MICHEL
Head Electro Active Polymers
Empa - Materials Science & Technology

ABSTRACT OF THE TALK

In the last decade the interest for “smart materials”, which respond to external stimuli by changing their shape or size, has increased. The operating principle of electronic EAP is based on Maxwell stresses generated by electrostatic fields. Among the electronic EAPs especially the dielectric elastomers are functional materials that have promising potential as muscle-like actuators due to their inherent compliancy and good overall performance. The combination of large active deformations, high energy densities and fast response is unique to dielectric elastomers. Actuator systems based on dielectric elastomer represent the main research and development activities of the EAP group at the Empa. This includes the synthesis of new dielectric materials, evaluation of fabrication technologies, modelling of the material-system (actuators) and developing new EAP actuator designs. In the talk the main projects at Empa will be presented, as well as some key results with a outlook to future work.