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DLR's Morphing Activities within the European Network

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Smart Structures technology called Adaptronics in Germany covers the entire field of making the elastomechanical behaviour of structures adaptable through structural integrated sensors and actuators. Three main objectives are targeted by influencing the elasto-mechanics of structures, i.e vibration control, noise reduction and shape control. The latter is directly related to morphing of airframes. The paper gives a survey of the related national and international activities where DLR is involved in since the early nineties. Seven years ago DLR started a new morphing activity aiming at a smart leading edge device. In a first step a functional demonstrator was realized which is able to continuously alter the shape of a leading wing edge under bending loads. As a second step a European consortium of leading research groups and European aeronautic industry started a common project in 2008 which aims to demonstrate the functionality of smart high lift devices in windtunnel tests. The paper gives a survey on the project and snapshots on recent results.

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