



Mechanical and Fluid Systems

# Self-Latching Piezocomposite Actuator

Piezocomposite actuator that does not require  
constant power draw

NASA Langley Research Center has developed a self-latching piezocomposite actuator. The self-latching nature of this invention allows for piezo actuators that do not require constant power draw. Among other applications, the invention is well suited for use in aerodynamic control surfaces and engine inlets.

## BENEFITS

- ➔ Saves mass by eliminating the need for some electrical equipment (controllers, power sources) required by other piezo actuators
- ➔ Requires lower power draw compared to current piezo actuators
- ➔ Eliminates the need for a persistent controlling electrical field
- ➔ Viable with many piezo materials

## APPLICATIONS

- ➔ Aircraft adaptive-camber airfoils, trim tabs, deformable engine inlets, and adaptive or adjustable vortex generators
- ➔ Space optics and reflector systems

technology solution



## THE TECHNOLOGY

The technology is a self-latching piezoelectric actuator with power-off, set-and-hold capability. Integrated into an aerodynamic control surface or engine inlet, the self-latching piezocomposite actuator may function as a trim tab, variable camber airfoil, vortex generator, or winglet with adjustable shapes. Deflections could be made in-flight, and set and maintained (latched) without a constant power draw, which current piezo actuators require to control and manage their electric fields. The control device leverages the shape memory behavior (specifically, the remnant stress-strain behavior) to create a morphing actuator that changes and holds the new shape with no applied control signal.



The invention could be applied to aircraft engine inlets.

## PUBLICATIONS

Patent Pending

National Aeronautics and Space Administration

### The Technology Gateway

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