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Bypass Valve Applied to the Electro-Hydraulic Actuator (EHA)

Compact bypass valve EHA design improves efficiency, speed range, and affordability for aerospace, robotics, and machinery.

Increasing interest in the replacement of traditional hydraulic architectures with energy-efficient, plug-and-play systems has led to great potential for electro-hydraulic actuator (EHA) technology. Current EHAs have a wide range of applications within mechanical systems, but they are often limited by overall efficiency as well as the range of functional actuation speeds. Researchers at Purdue University have developed a concept for an improved EHA system that increases efficiency and range of actuation speeds while decreasing cost and size of the EHA unit. This concept represents a step forward for the application of EHAs in place of their traditional hydraulic counterparts.

Advantages:

- More compact than existing solutions

- Lower cost than existing solutions

- Increased efficiency and energy recuperation

- Improved range of actuation speeds using a fix-displacement pump

Applications:

- Heavy duty mobile machinery

- Aerospace

- Robotics

- Prosthetics

Technology Validation:

Technology ID

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Category

Medtech & Digital Health/Wearable Health Tech & Biosensors

Aerospace & National Security/Hypersonics & Propulsion Systems

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This technology has been validated through laboratory testing and computer modelling.

TRL: 3

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