

# A Polyvinyl Alcohol Based Passive Wing Morphing Strategy

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## **Abstract**

Cross-domain vehicles have been proposed as powerful tools for environment data collection. However, it is challenging to balance their efficiency in air and water, while using mechanical means of morphing will deplete energy and available space. This research proposes the usage of polyvinyl alcohol (PVA) material with biodegradable structure to fabricate an easily manufactured irreversibly morphing wing profile, demonstrating an example of morphing from a MH-78 airfoil to a symmetric foil closely resembling NACA-0009 upon entry to water. Existing data support that the proposed strategies are potentially useful for small air-water cross domain vehicles aiming for zero pollution and high efficiency due to its capability to boost the overall operation duration of the vehicle.

Keywords: Cross Domain Vehicle, Fluid Dynamics, PVA

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