

# Control of very flexible structures with aerodynamic loading

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Extracted from:

<https://www.nasa.gov/centers/dryden/multimedia/imagegallery/Helios/ED01-0230-1.html>

High-Altitude Long Endurance (HALE) vehicles, and more recent High-Altitude Platforms (HAPs), usually employed for air-reconnaissance, atmospheric exploration and telecommunication applications are canonical examples of dynamical systems for which extreme flexibility is a fundamental design requirement. In particular, the goal of maximising overall flight time demands lighter and slenderer wings which is further exaggerated by the requirement for maximal surface area to host solar panels for self-powering. A well-known example, which shows the failure of conventional control techniques employed on very flexible aerostructures, is NASA's prototype Helios (figure). Our goal is to design control strategies, implementable in real time, that build on accurate predictions of the intricate behaviour of this new generation of very flexible aircraft.



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