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Analysis of a hydrofoil craft with a suspension system

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In this paper we investigate the efficacy of augmenting, or replacing, an active height control system for a submerged hydrofoil with a passive system based on springs and dampers.

A state-space model for submerged hydrofoils is formulated and extended to allow for a suspension at the front wing, aft wing or both wings. The model is partially verified by obtaining results in the fixed-wing limit and comparing these

with experimental data from the MARIN Foiling Future Demonstrator.

In the current study we limit ourselves to translational springs, only allowing suspension motion in the heave direction. This results in unfavorable behavior: either the motions increased or the system becomes unstable. It is therefore recommended for future research to try rotational springs.

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