

Abstract Submitted  
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**Harnessing Energy from Arrays of Oscillating Hydrofoils** FILIP SIMESKI, ARIANNE SPAULDING, JENNIFER FRANCK, School of Engineering, Brown University — Computational Fluid Dynamics (CFD) simulations are performed on multiple-hydrofoil systems for the application of energy harvesting. Oscillating hydrofoils generate power through a coupled heaving and pitching motion. Various linear and staggered configurations consisting of three to four hydrofoils are simulated, and the system efficiency of the array is evaluated, as well as the energy density of the system. Of particular interest is the observation that regular vortices from the foils leading and trailing edges develop into a well-structured wake affecting performance of downstream-located hydrofoils in the system, and leading to an optimal phase difference between foils. Simulations are performed at a Reynolds number of 1000, and utilize OpenFOAM with dynamic meshing libraries employed to handle the foil motion.

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