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Wave Generation Experiments Using a Cycloidal Turbine[1] STEFAN SIEGEL, THOMAS MCLAUGHLIN, US Air Force Academy — We investigate the wave generation performance of a cycloidal turbine for the purpose of converting wave energy to shaft power. Cycloidal turbines consist of one or more hydrofoils that rotate around a central shaft and can be pitched during rotation. In the present investigation, a two-dimensional wave channel of 45cm width, 4.5m length and a water depth of 30 cm is used. It features a flap wave maker at one end, and a beach at the other end. A two blade Cycloidal turbine model is placed in the center of the wave channel and the generated waves in both up-wave and down-wave directions are measured using wave gauges. We compare the results to inviscid potential flow simulations that show negligible waves traveling up-wave, and a single harmonic wave traveling down-wave making the Cycloidal turbine an ideal wave energy converter if synchronized to the incoming wave.

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