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Wave-forced reconfiguration of a 2D artificial canopy SYLVIE BARSU, DELPHINE DOPPLER, NICOLAS RIVIRE, MICHEL LANCE, LMFA, Universit de Lyon, CNRS UMR 5509 — Blades inside aquatic vegetation canopies show collective motion when submitted to a water flow. Coherent deformation waves might be observed under given flow conditions, which might enhance mass and sediment transfers between the canopy and surrounding flow, thus impacting the plants development. However, most studies have been focused on the flow velocity while the cover motion has been far less studied. Here we present experimental results about the dynamic reconfiguration of a single array of PVC blades in a wave flume. The oscillations of the blades are imaged while the water level is separately measured using resistive probes. A delayed coherent wave motion is observed within the canopy, as a response to the oscillatory flow. The associated transfer function (amplitude, phase, wave speed) is built by correlating blade displacements and water local velocity time series. The canopy-flow interaction is then modelled by a simple linear damped oscillator chain whose parameters are deduced from experiments.

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