

River & Tidal Energy Extraction

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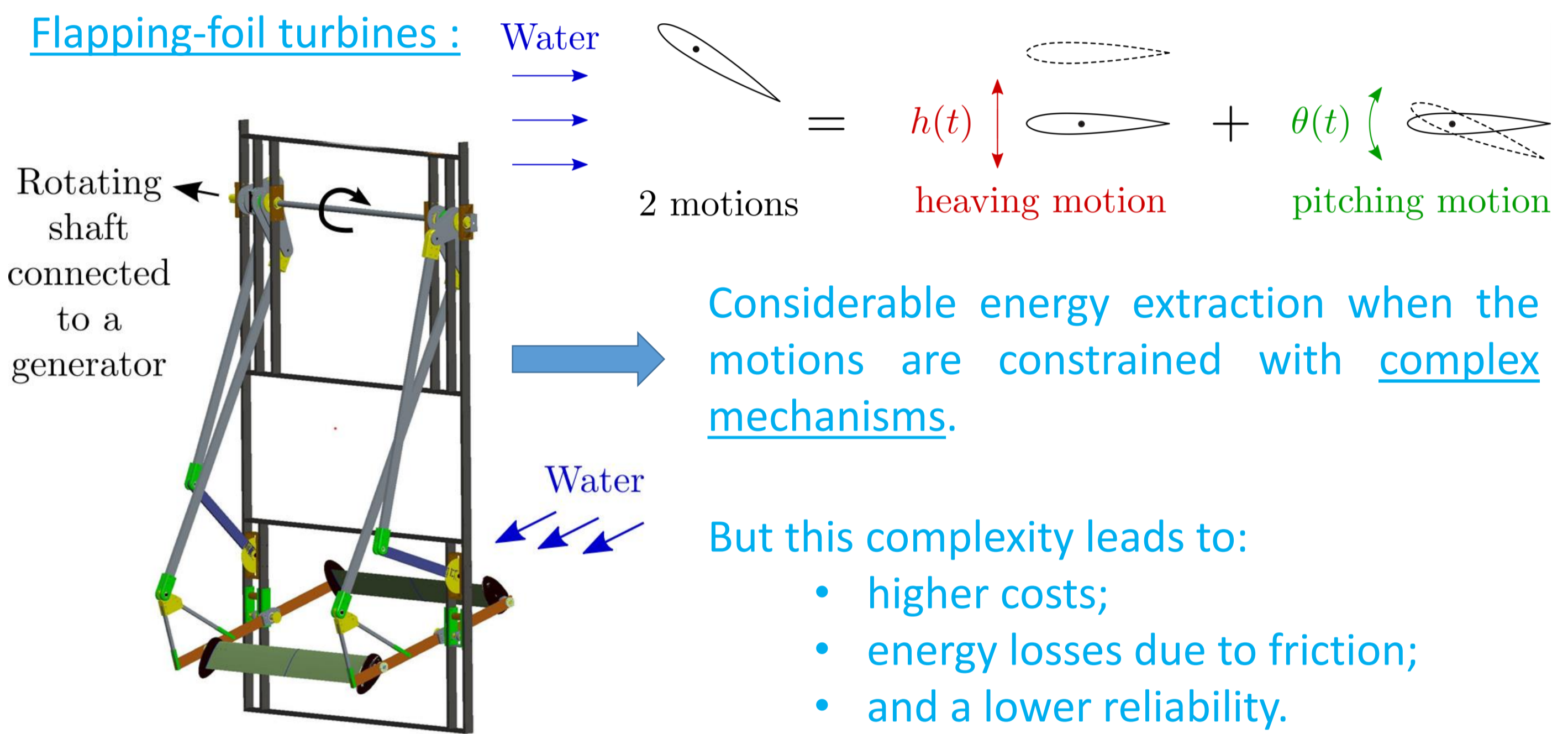
Clean and Renewable Technology for Energy Extraction from River or Tidal Currents

Hydrokinetic turbines extract the kinetic energy of a water flow like wind turbines do it with the wind.

Hydrokinetic VS wind turbines :

- high density of water ➔ smaller apparatus;
- water currents are more predictable...
- ... and more constant over time.

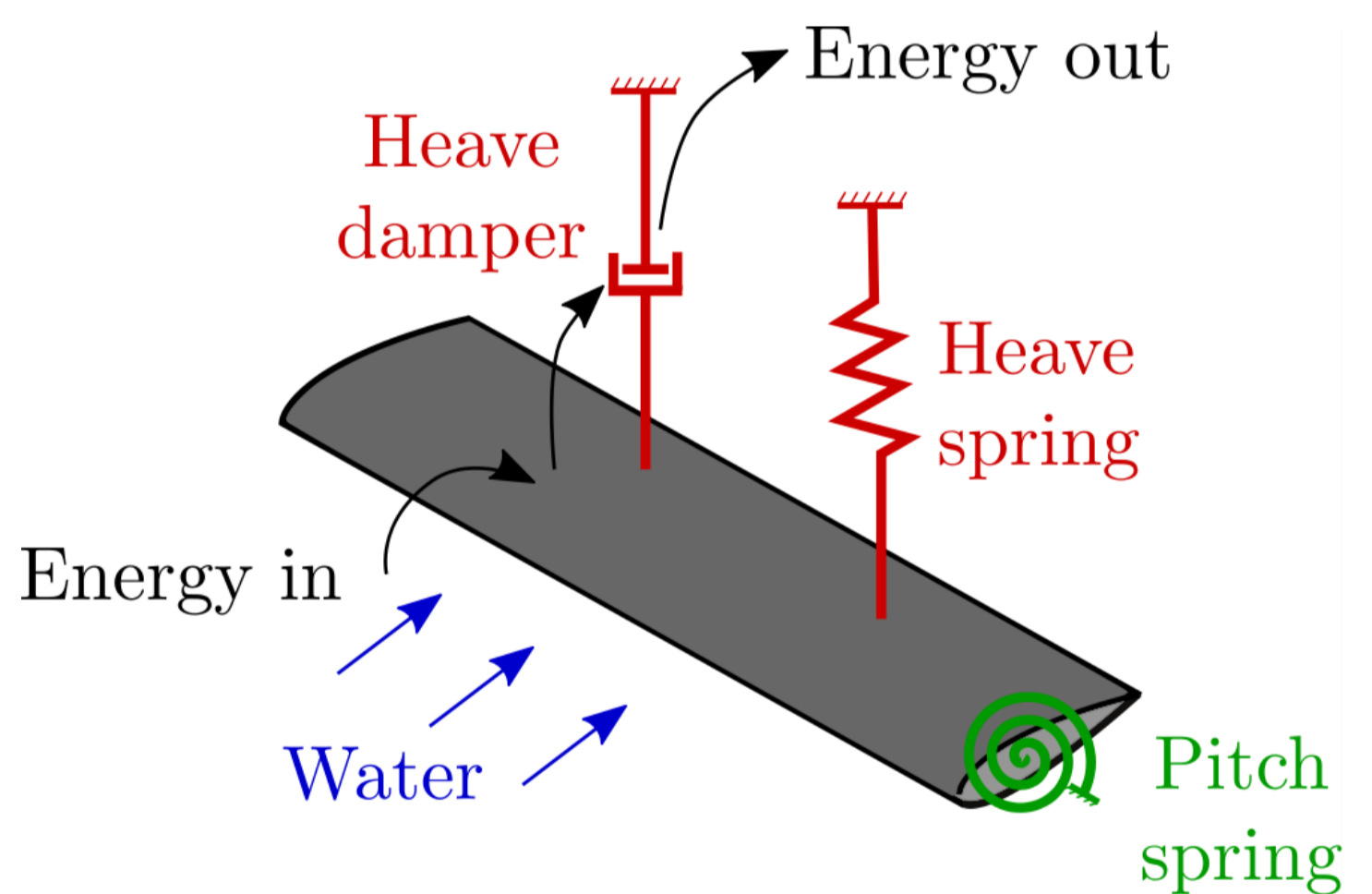
Flapping-foil turbines :



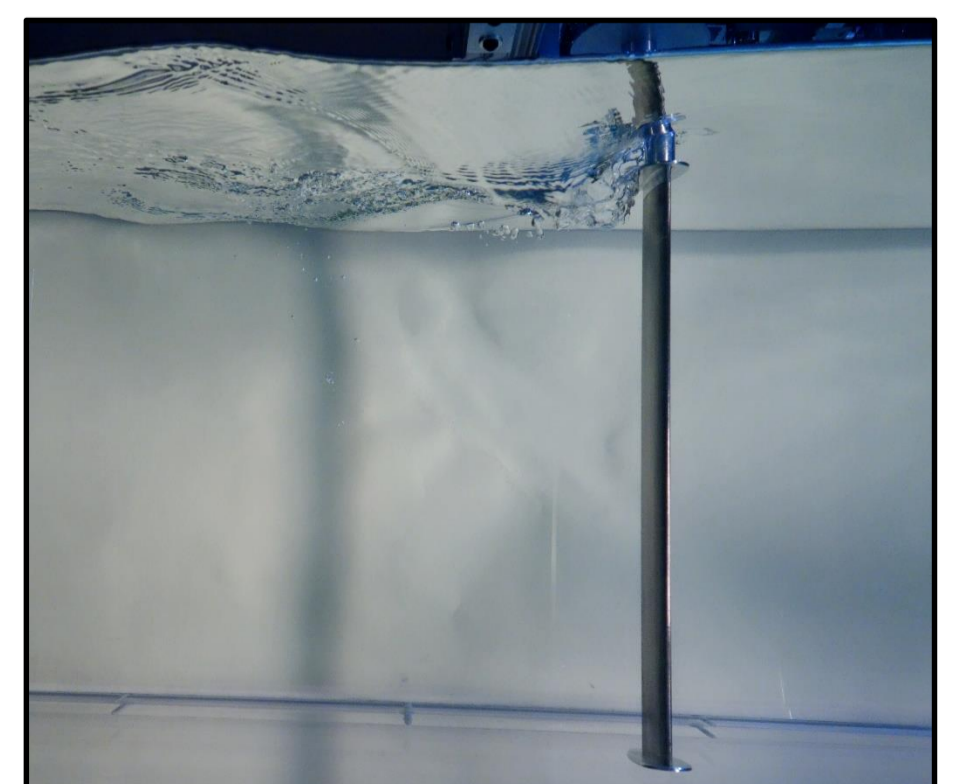
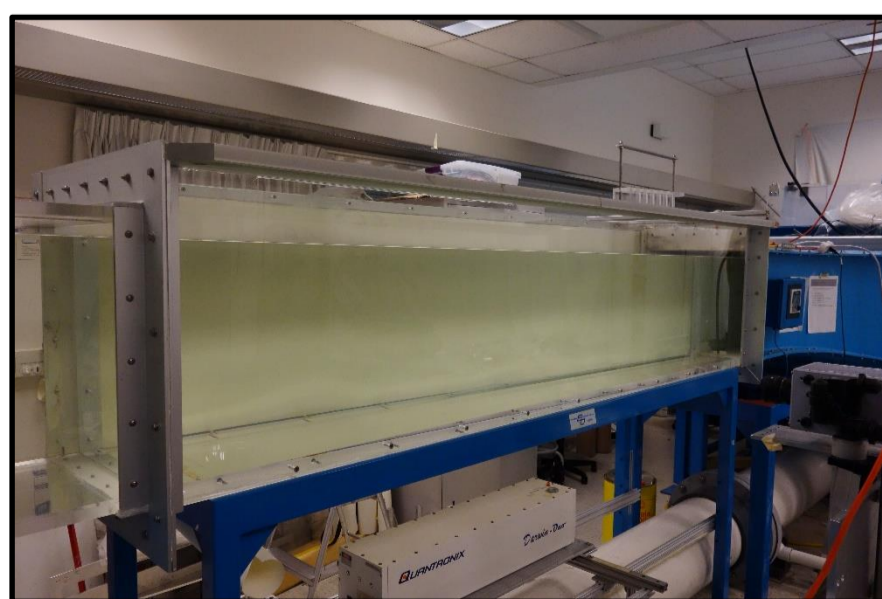
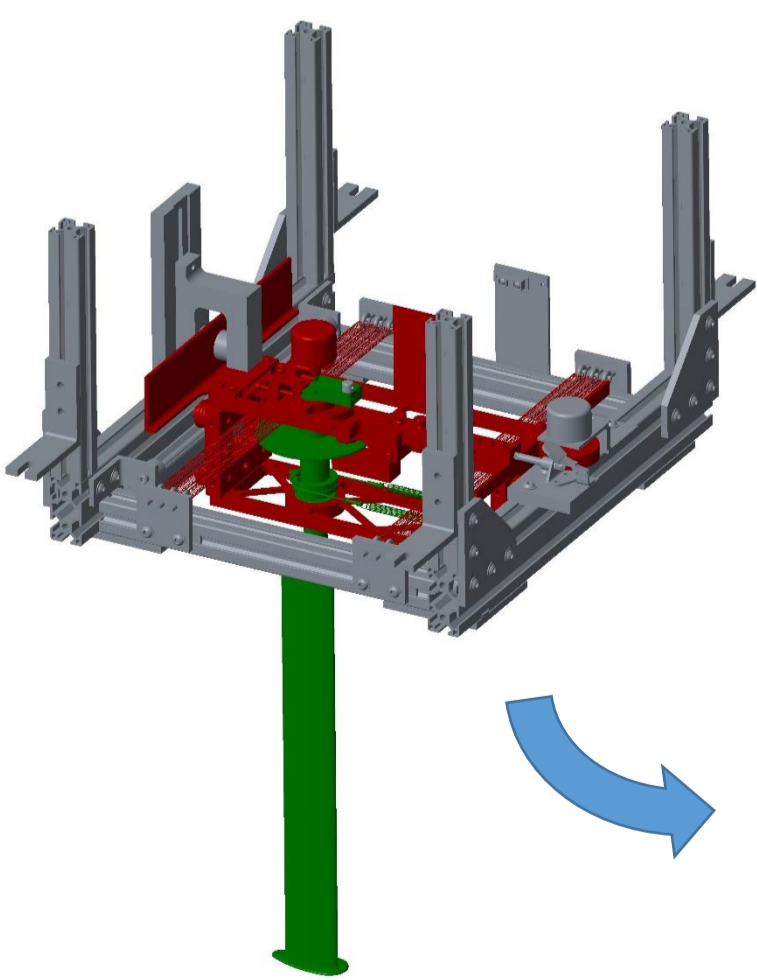
The proposed innovation : the *fully-passive flapping foil turbine!*

The complex mechanical links attaching the blade are replaced by elastic supports (two springs and a damper).

The heaving and pitching motions are not imposed, but rather result from the interaction of the supported blade with the flow.



The kinetic energy of the water is transferred to the blade and then to the damper, which models, in the preliminary experiments, the presence of an electric generator that would convert this energy into electricity.



The prototype tested in a water channel has confirmed the great potential of this concept!

The next step : A numerical simulation campaign will be performed in order to find out the set of structural parameters that will result in the optimal fully-passive flapping-foil turbine.