Development of an ultra-low head flow-induced vibration turbine– SERB

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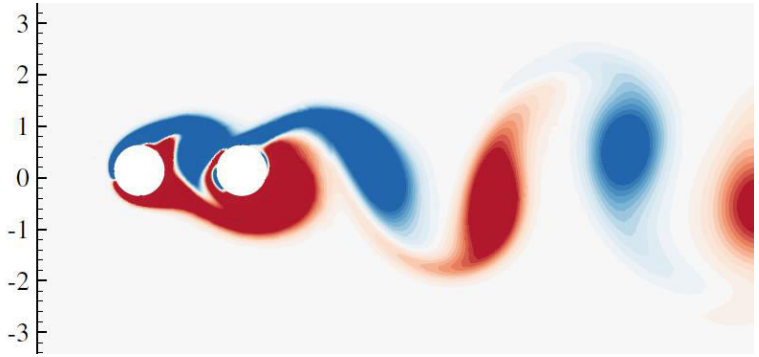
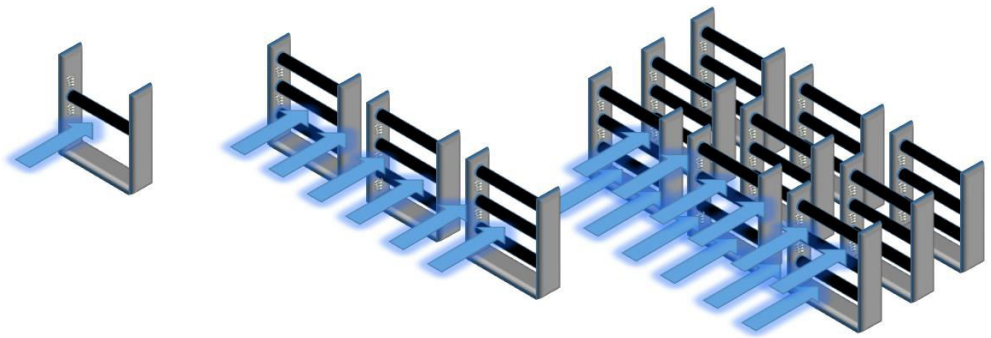
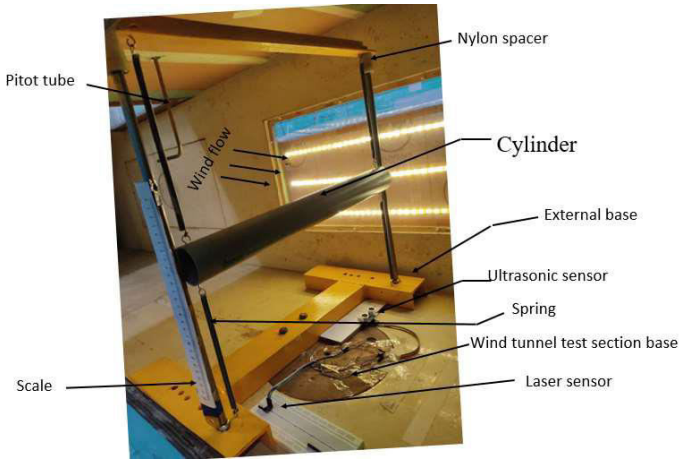
- Hydro energy is a form of renewable energy which is available for almost every day and night during a year.
- Low-head hydrokinetic turbines offer the possibility of extracting flow energy using lower infrastructure cost.
- Unlike traditional blade turbines, flow-induced vibration based turbine can be tuned to operate at different flow velocities.
- The FIV based turbine can operate at a constant frequency even when there is a moderate change in the fluid velocity.
- Laboratory tests shows ability to extract energy at flow speeds as low as as 0.2 m/s..
- Objectives:
  - Calculations of flow energy extraction efficiencies of various bluff body geometries such as rectangular and elliptic prism using Numerical simulations.
  - Development of a water tunnel facility for flow-energy harvesting studies.
  - Experimental validation and high Reynolds number extension of the efficiencies.
  - Field testing of a prototype to calculate its practical cost per watt value.





Different scales of FIV power plants: (a) Pico (micro to 5 kilo watts) (b) Micro (~ 100 kW) and (c) small and large (1- 100MW)



Wind tunnel testing of FIV turbine at IITG

A 20 X 20 cm^2 test section water tunnel designed and fabricated at IITG