An Improved Aerofoil Body

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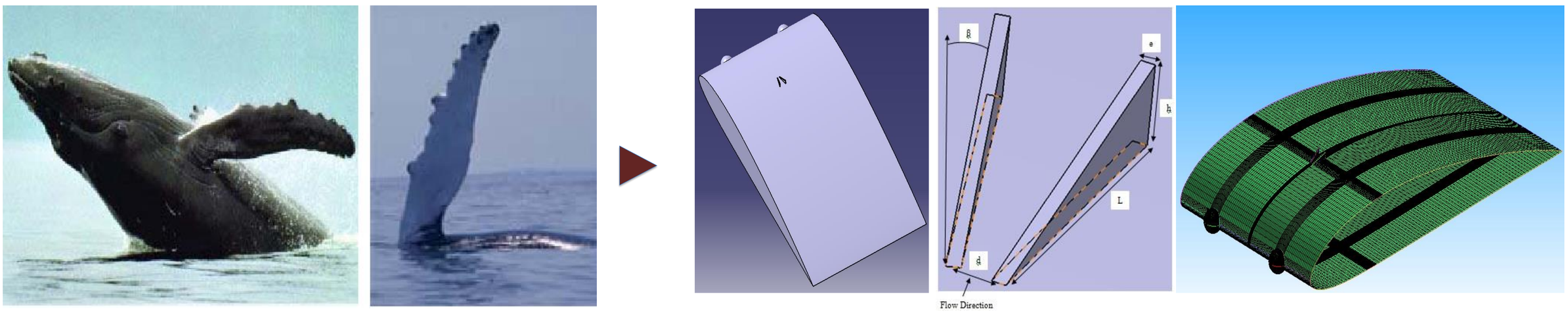

Combination of Humpback Whale Tubercles with Vortex Generators

BRIEF TECHNOLOGY

The technology relates to an improved aerofoil body that achieves improved aerodynamic performance by way of incorporating passive fluid-flow control devices. The flow control devices are the combination of vortex generators and tubercles devices.

CURRENT ISSUES

Humpback whale Tubercle Leading Edge (TLE) have been proved to work in case of low Reynolds number flows. UAV's operate at low speeds and fall in this Reynolds number range.

The Problem:

- Existing TLE edges are only effective at high angles of attack and increase drag at low angles of attack.
- Existing Vortex Generators (VG's) have shown to improve wing performance but further improvement can be achieved.

INVENTIVENESS & NOVELTY

- The combination of TLE (Spherical or Sinusoidal) and VG's has advantages in improving performance in both pre and post characteristics.
- TLE and VG combination will reduce noise in case of turbines and propellers.
- TLE and VG combination will prevent the damage to the structure due to the bursting of separation bubble.

APPLICATION

- Wind turbines, UAV's, marine propellers, industrial cooling fans
- The product is easy to fabricate (TLE+VG's).
- TLE can be fabricated using CNC's and VG can be attached over the surface

ADVANTAGES

- Higher lift for low Reynolds number
- Increase particle mixing
- Reduce the flow separation region
- Longer loiter time for small UAV
- Save fuel
- Save money

MARKET POTENTIAL

- The main market for the product is UAV's and aerospace industry.
- Other potential markets can also be wind turbines and marine propeller manufactures

TRL : 5 ***-Validation in real environment***

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