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“EUROINVENT”

research project

Technical University of Moldova,  
Department “Fundamentals of Machines Design”

## Aerodynamic wind rotor with vertical axis with variable angle of attack

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### Goal:

Starting the wind rotor at low speeds and braking it at higher airflow speeds.

### Solution:

1. The wind rotor consists of helical aerodynamic blades installed with the possibility of varying the angle of attack depending on the speed of the air current.
2. The aerodynamic shell profile blade on the upper or lower part is equipped with a cavity with curved walls to stimulate the start of the rotor by the reactive action of the air flow at low speeds on the blades.
3. The blades are mounted in the rotor by means of at least two V-class kinematic couplings on a common axis placed at an angle  $\gamma$  on the rotating surface of the rotating hyperboloid with a blade.
4. Identification of the optimal constructive parameters of the blades and V-class kinematic couplings for their assembly in the wind rotor in relation to their common axis.

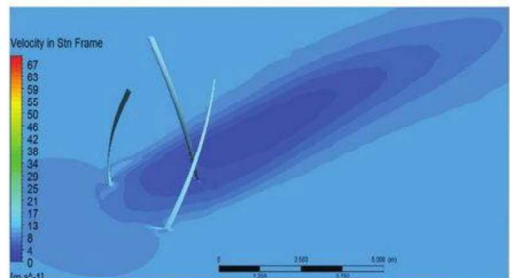
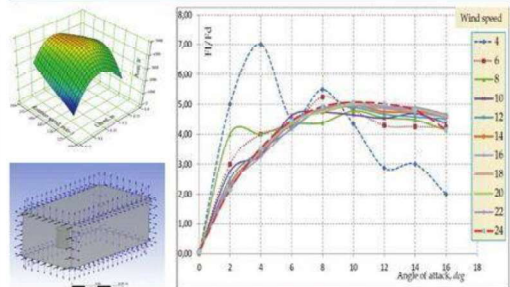
### Advantages:

1. Increase the operating reliability of the wind turbine with automatic rotor rotation starting and braking regimes;
2. Increasing the efficiency of wind energy conversion by widening the speed range ( $V_{\text{start}} - V_{\text{brake}}$  of the wind rotor);
3. The constructive simplicity of the wind turbine.

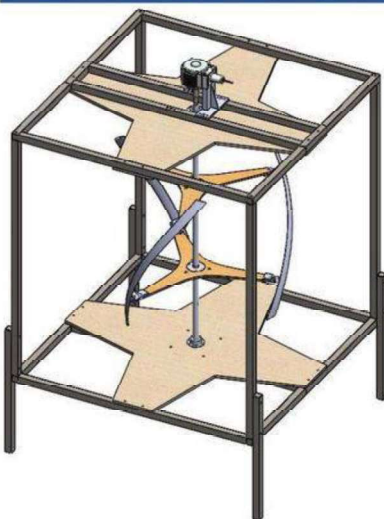
### Stage:

Design-manufacture-research of the experimental prototype.

Verificarea poziției optime a profilului aerodinamic  
asimetric prin simulări CFD



Computerized model of the vertical-axis  
wind turbine with permanent magnets



Jointed links with V-class kinematic  
couplings Blade-Rotor with common shaft



Experimental prototype of the wind turbine with  
vertical axis researched in aerodynamic tunnel

