MOMENTUM AR-GE

momentum

OUR CAPABILITIES

01.2020

Company Name: Momentum Ar-Ge
Date of Establishment: 02/04/2014
Partnership Structure: Proprietorship (Limited)
Number of Employees: 3

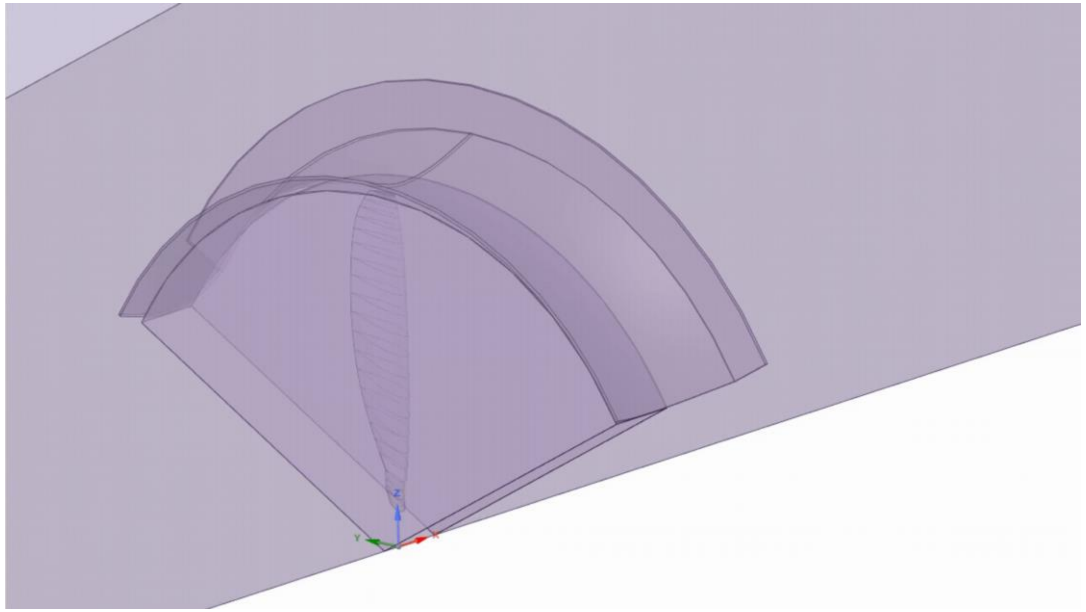
Rahmi Erdem YILDIZ
Project Lead / CEO
Mechanical Engineer (BSc, METU)
Aerospace Engineering (MSc, METU, cont')

Abdurrahman EKİNCİ
R&D Engineer
Aerospace Engineer (BSc, METU)
Engineering Sciences (MSc, METU, cont')

Halit KUTKAN
R&D Engineer
Mechanical Engineer (BSc, EGE U.)
Aerospace Engineering (MSc, METU)
Mechanical Engineering(PhD Student, METU, cont')

DESIGN

- Aerodynamic Design
  - Aerodynamic Surface Design
  - Geometry Parameterization
  - Optimization
  - Scripting



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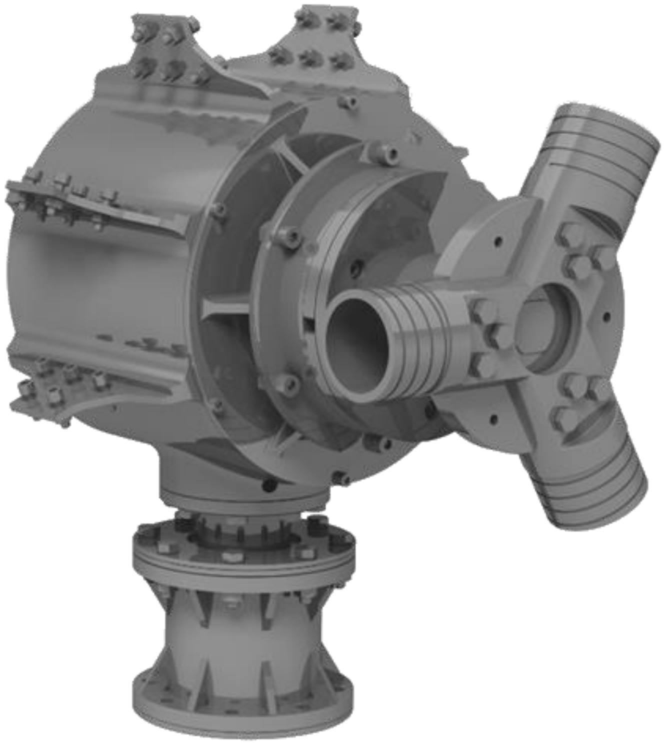
DESIGN

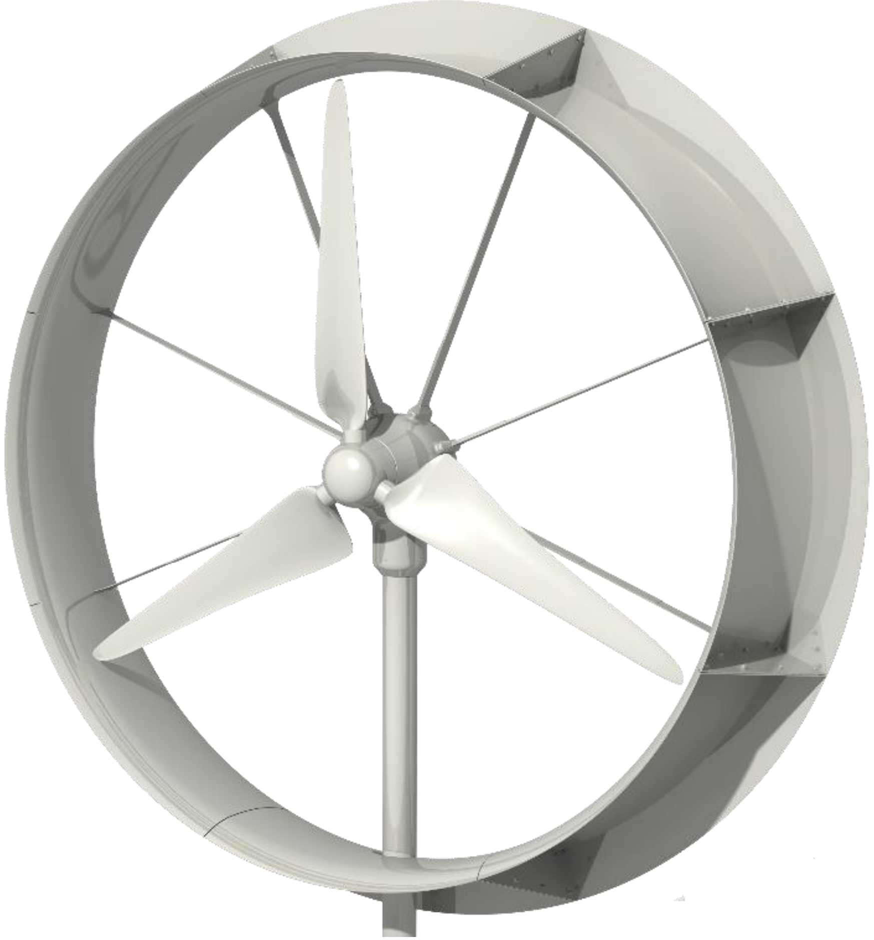
– Mechanical Design

Conceptual and detailed mechanical designs at system and component level complying with standards (IEC, ISO and MIL-STD)

• Topology Optimization

Weight reduction of components by satisfying the strength requirements





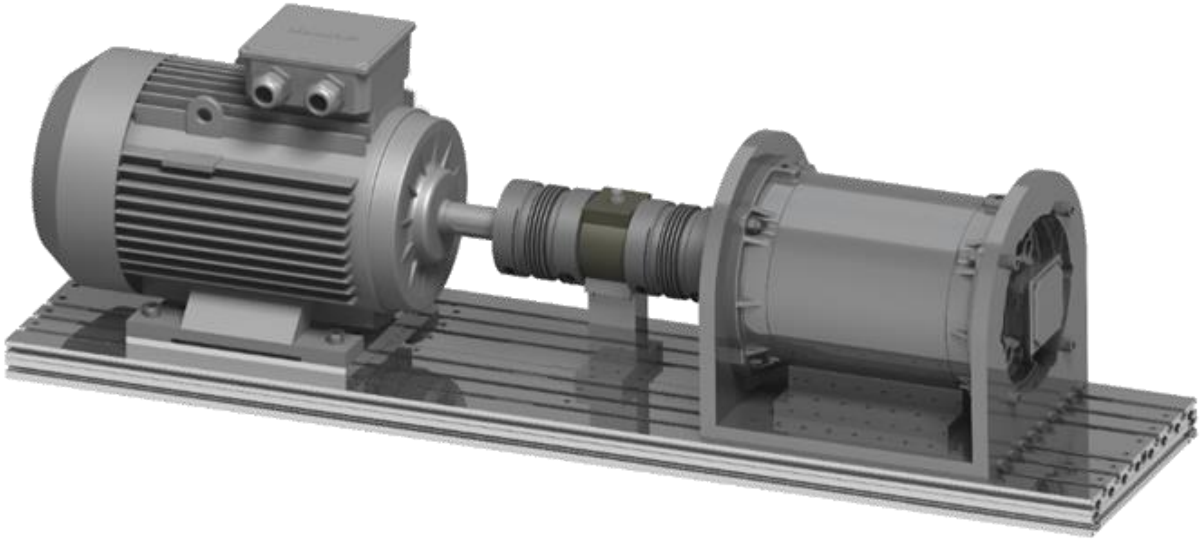
DESIGN

– Test System and Test Setup Designs

Custom designs of test systems and test setups.

- ### Generator Test Setup

We've designed and manufactured generator test setup that can be controlled via LabVIEW. All range of generator's working characteristic data in the technical specification sheet is verified with the tests.



DESIGN

- Wind Tunnel Test Setup

We've conducted wind tunnel tests with our test prototype .

FLOW SIMULATION

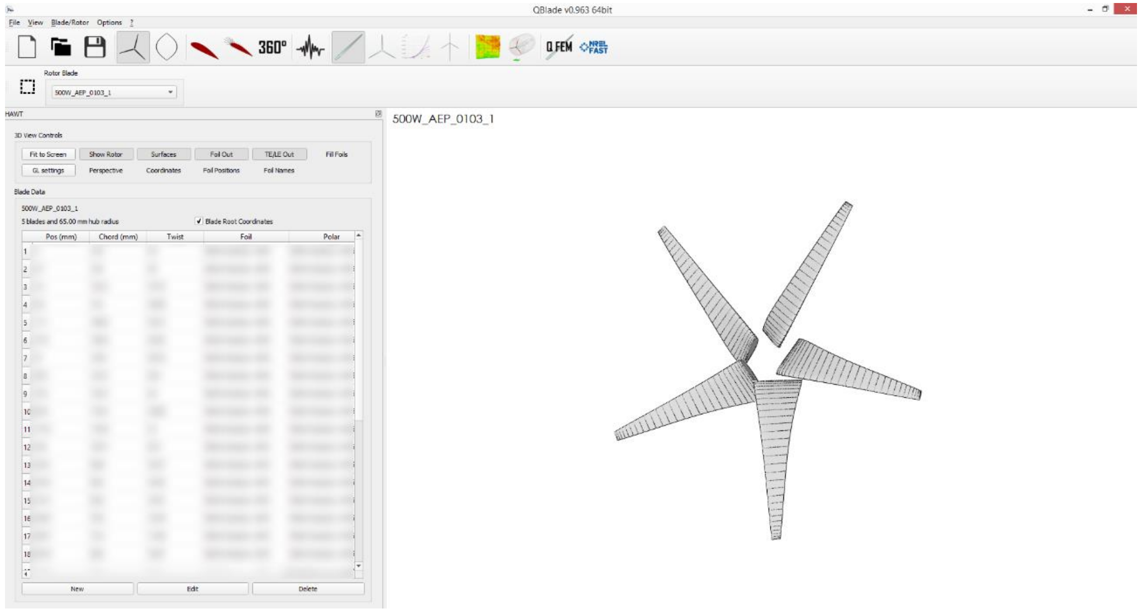
– Blade Element Momentum Theory Analysis

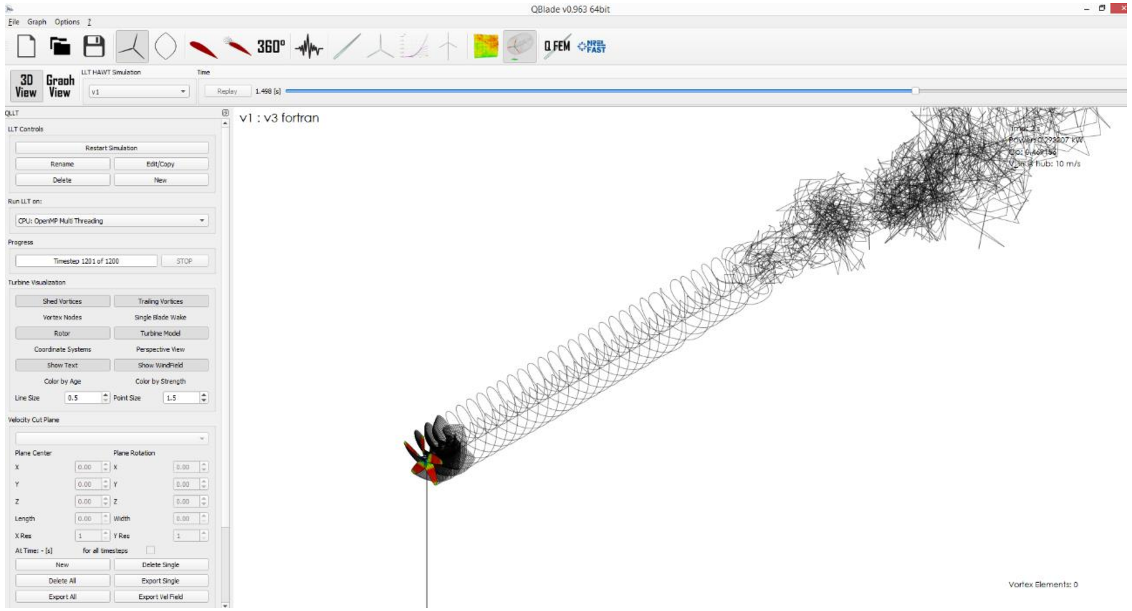
• In-house Codes

Our team has writing our own codes when needed using FORTRAN, MATLAB and Python languages. There are many in-house codes that is being used in Momentum for preliminary design, optimization and analysis.

• QBlade

QBlade is being used extensively for preliminary rotor design. We can use both BEM and Non-Linear Lifting Line module.

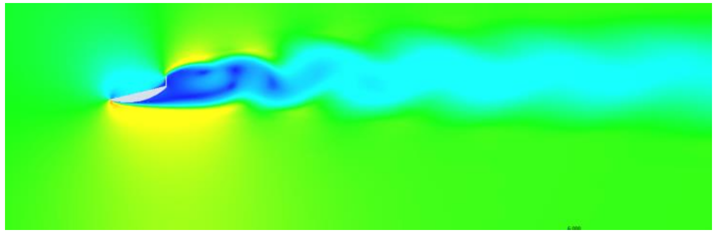


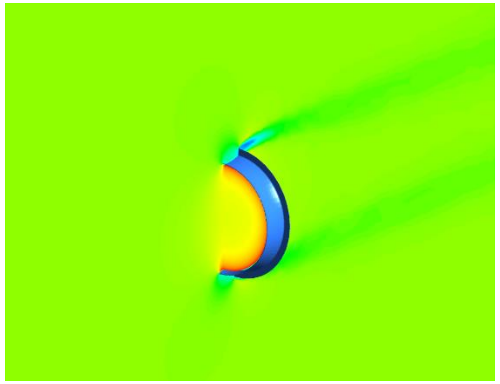


FLOW SIMULATION

– Aero CFD

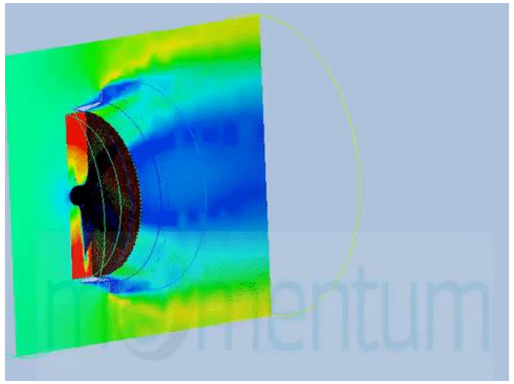
• 2D/3D





Our team has the capability of analyzing many 2D and 3D flows by using structured and unstructured meshes.

• Steady/Transient



Our team can study steady flow physics for quick analysis. Additionally, we've done many transient simulations for time dependent physics like stall, cut-in, etc.

• Internal/External Flows

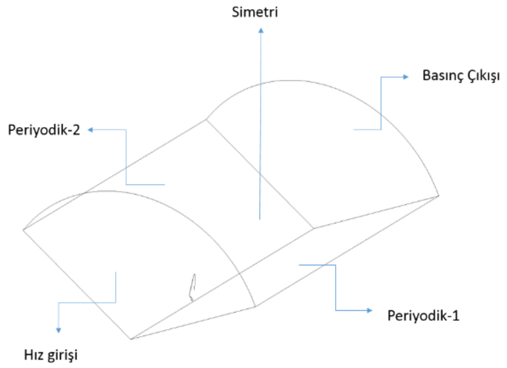
We are able to analyze both internal and external type flows with wide range of Reynold's number.

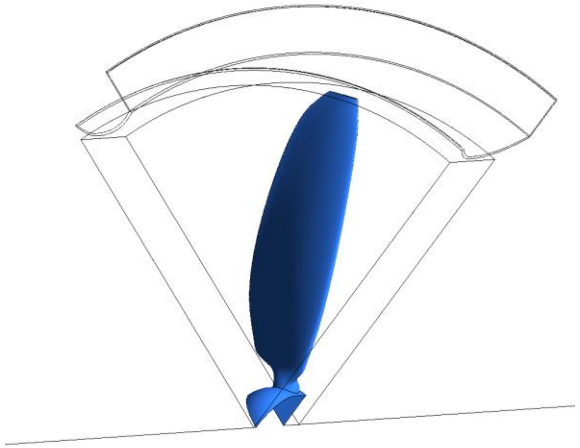
FLOW SIMULATION

– Turbomachinery Simulation

• Periodic Flow Simulations

Our team has many experiences of using periodic flow concept to get quick solution for preliminary design and optimization.



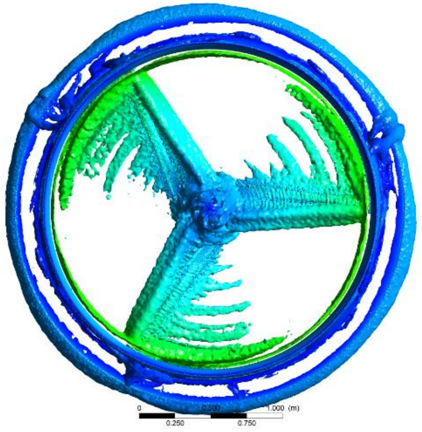


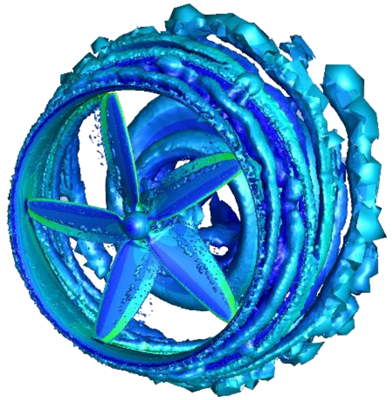
• Moving Reference Frame(MRF)

MRF and Rotating Region concept simulations are being used by our team extensively for both transient and steady simulations.

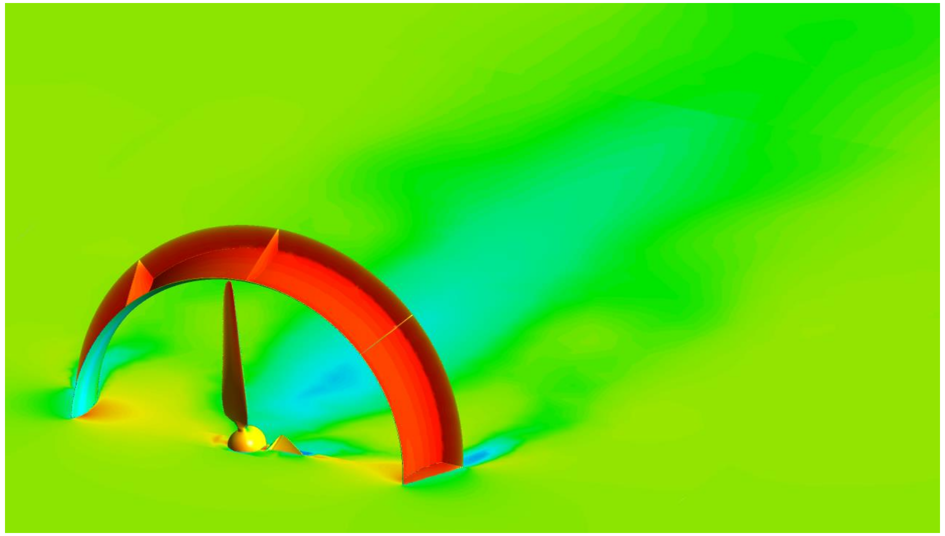
FLOW SIMULATION

- Sliding Mesh
- Dynamic Mesh
- 6DOF





Our team has many experiences for transient type turbomachinery simulations; Sliding Mesh, Dynamic Mesh, 6DOF in case of transient flow physics like cut-in, stall and yaw.



FLOW SIMULATION

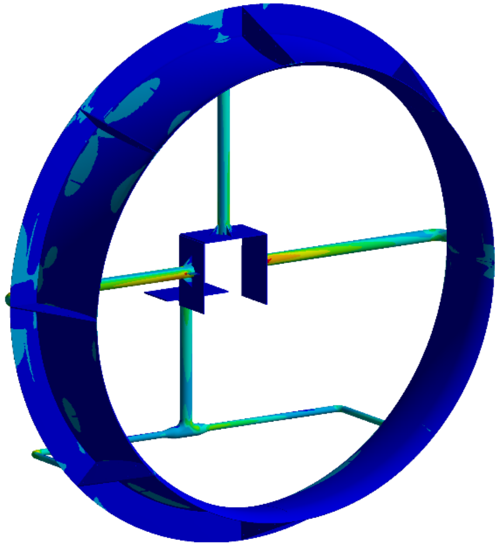
- Aerothermal CFD
  - Heating/Cooling
  - Fan Design and Analysis
  - Heat Exchanger
  - Air Conditioning Systems Analysis

With our expertise in flow physics and CFD, our team has the capability of doing simulation for Aerothermal applications.

STRUCTURAL ANALYSIS

– General

Examining the strength of structures under static or dynamic loads with proper BC's. Analysis with linear and nonlinear materials. Elastic and Plastic region behaviors.

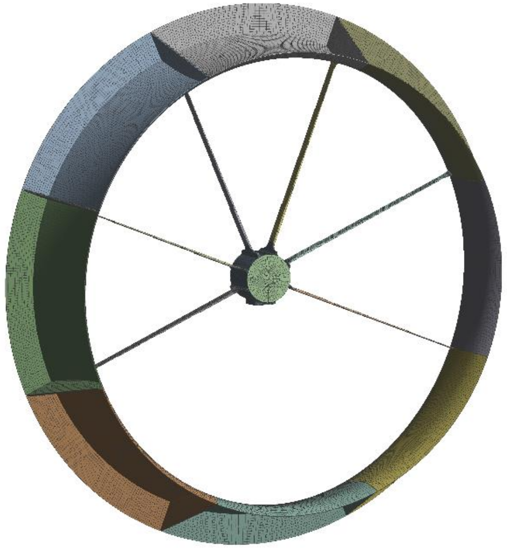


- ### Static Analyses

Investigation of displacement, stress, strain under static loads such as static weight, wind loading and gyroscopic effect.

- ### Transient Analyses

Assessment of displacement and stress behaviors of materials under varying loads.



- ### Fatigue

Fatigue analysis of isotropic materials through the acquired field experiment data.

- ### Explicit Analyses

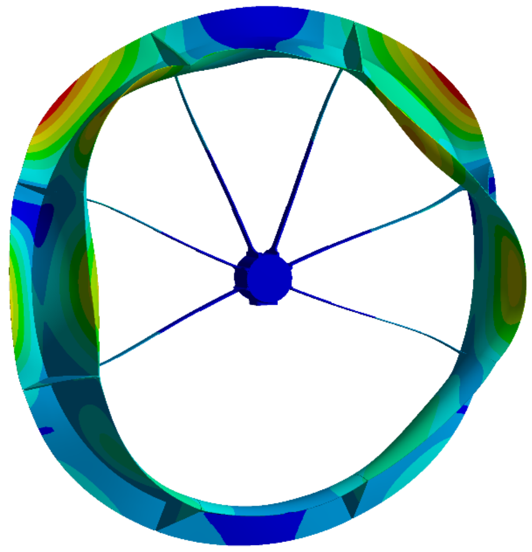
Elastic and plastic deformation investigations under such conditions like falling, crush and shock.

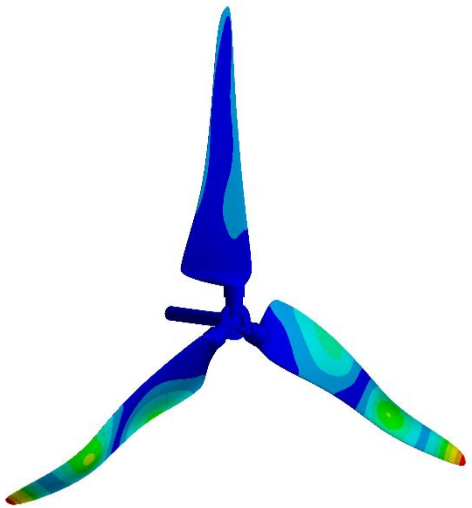
- Modal Analyses

Natural frequency mode extraction and assessment of efficient modes.

- Vibration Analyses

Stress and fatigue limit assessment according to PSD values.





Contact

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