



The Design of Axial-flux Machine for Wind Turbine Systems

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Internship Plan

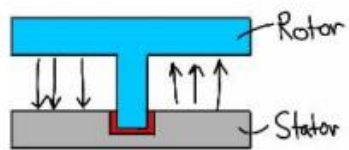
- Structural Mechanics in connection with ANSYS Mechanical
- Topology Optimization
- Introduction to ANSYS Application Customization Toolkit (ACT)
- High-performance computing
- Contact Modeling in connection with ANSYS Mechanical

CADFEM[®]

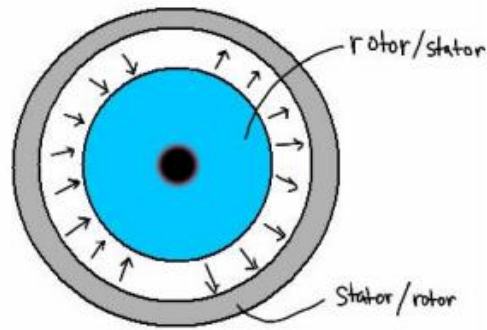
Simulation ist mehr als Software[®]

ANSYS[®]

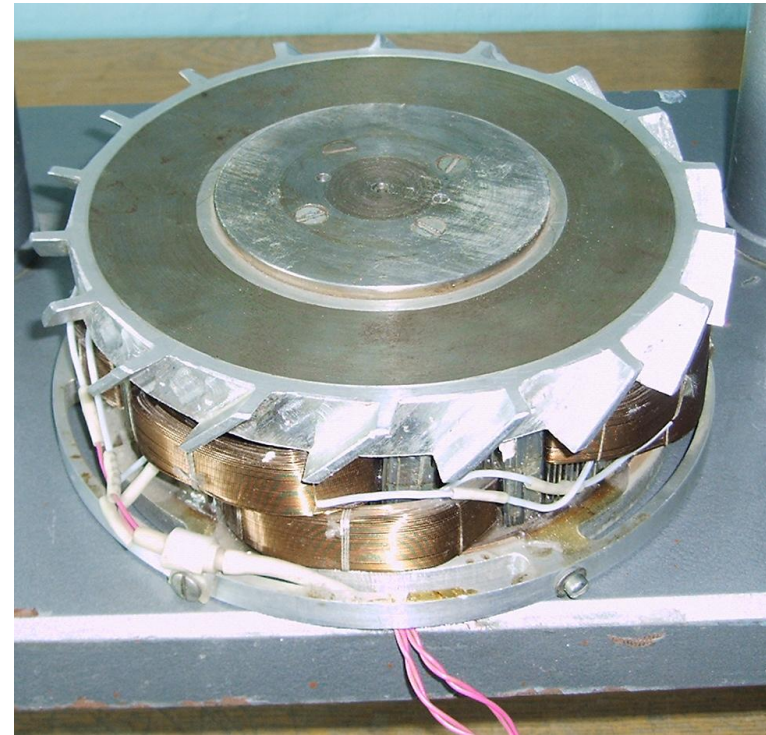
Axial Flux Permanent Machine



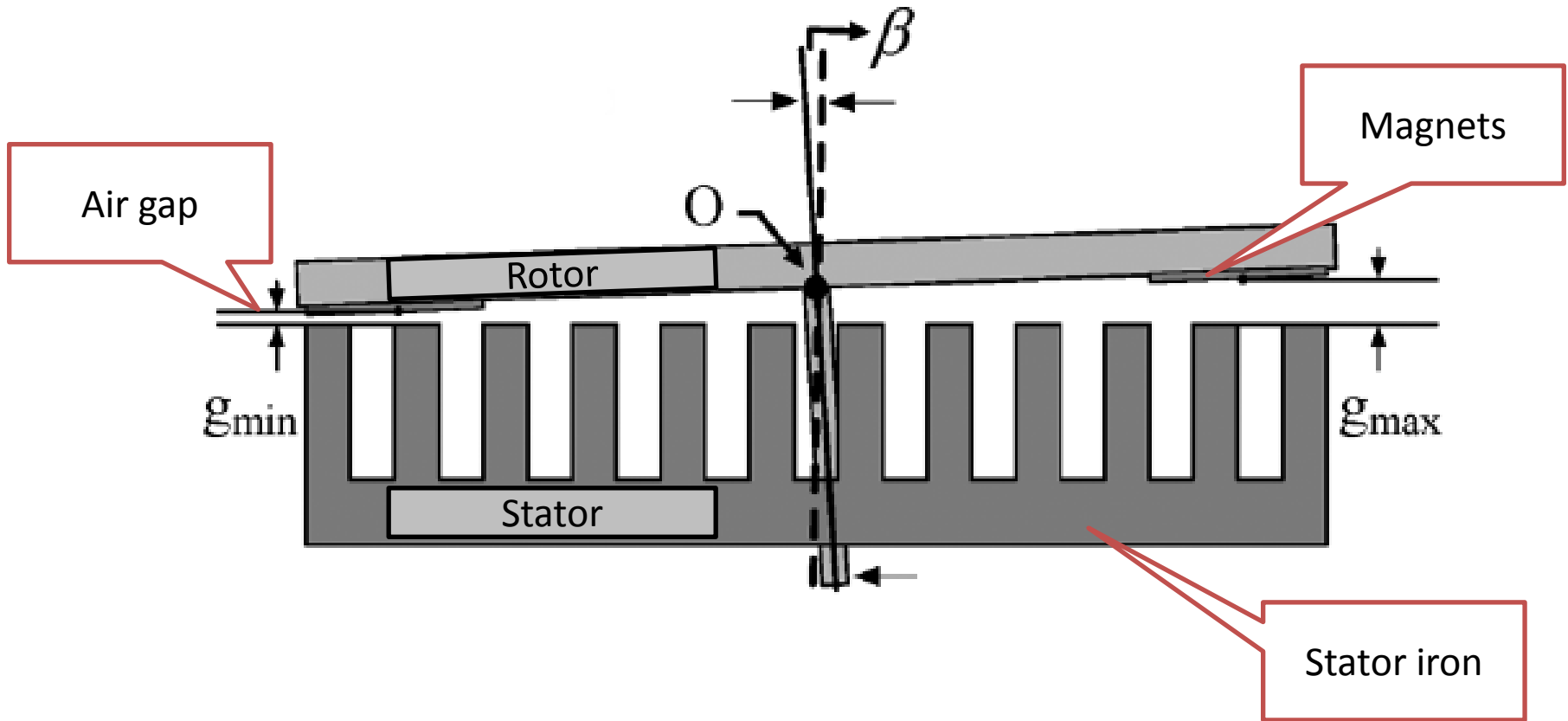
Axial-flux



Radial-flux



Air-gap Eccentricity

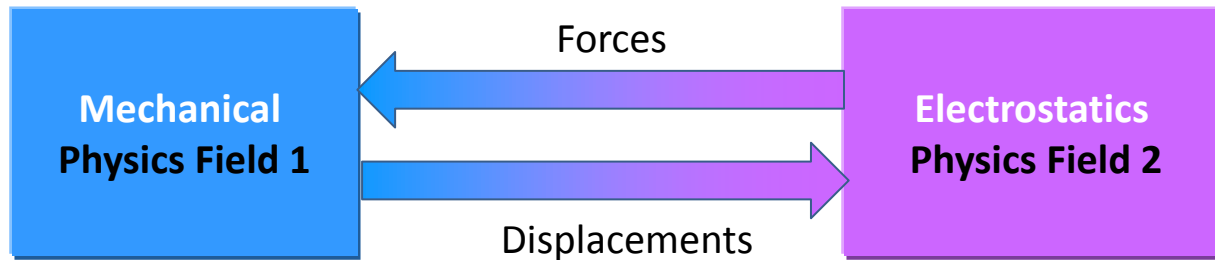


Multiphysics



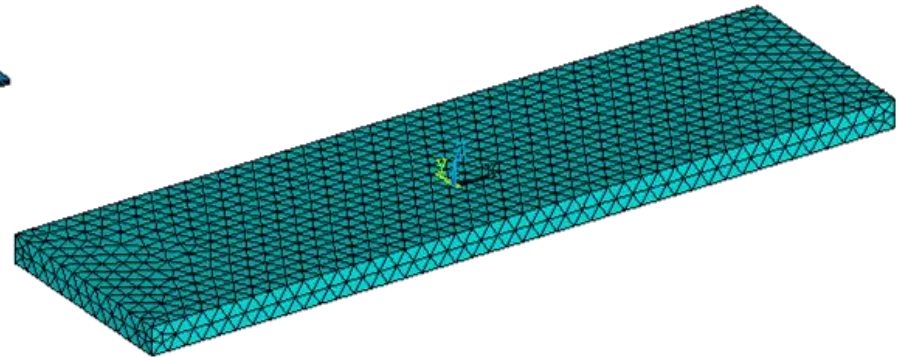
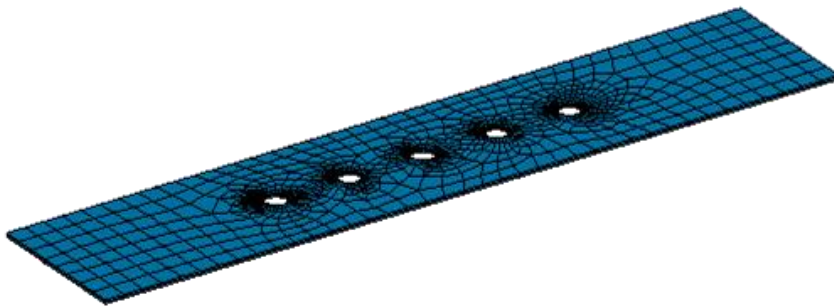
- Electromagnetic – Solid Coupling
 - **Forces due to magnetic field move/interact with mechanical structures.**
 - Magnetic force (linear systems)
 - Magnetic torque (rotary systems)
- Applications:
 - Actuators / Solenoids
 - **Rotating machines**
 - Alternators
 - Motors

Structural + Electrostatic

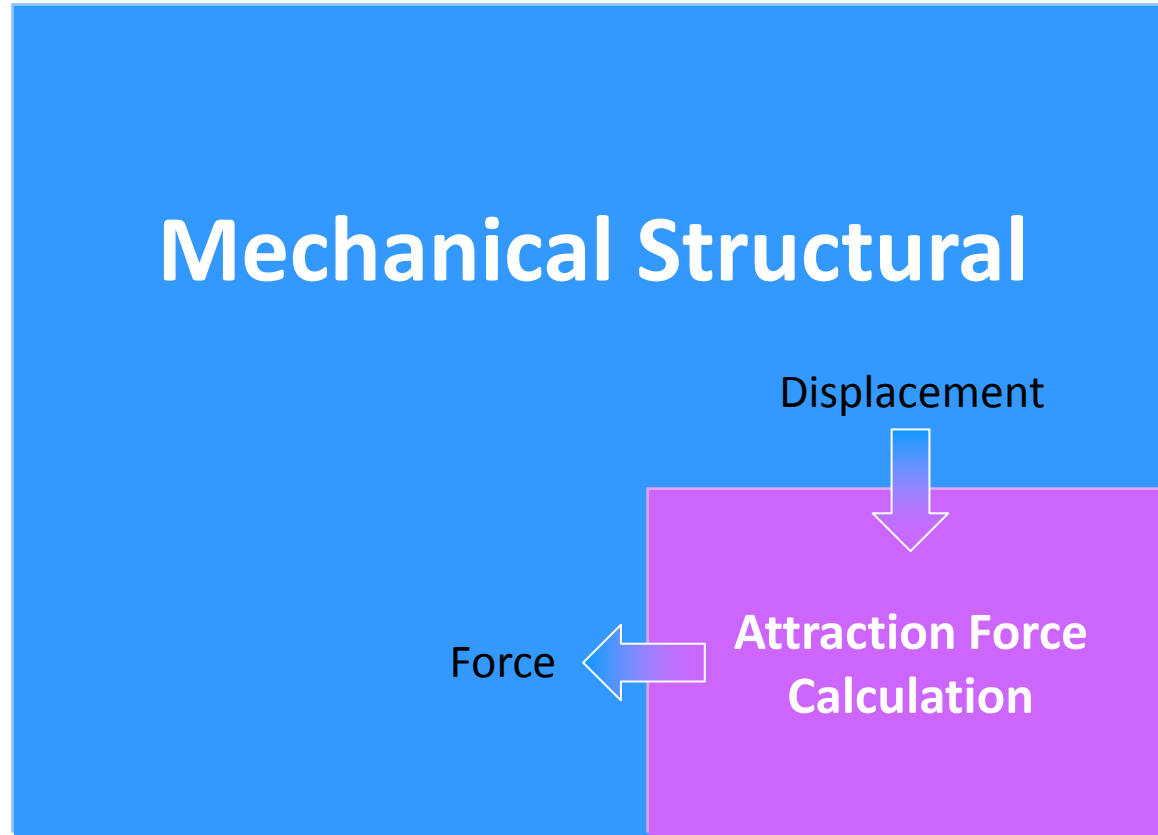


Structural mesh: 1 894 elements

Electrostatic mesh: 16 353 elements



Mono-physic Analysis



Solution

1. Automated parametric modeling of the stator and the rotor
2. Applying the tension force in accordance to calculated expressions
3. An iterative calculation of the **task**, including both previous steps

ANSYS Workbench ACT Extension

