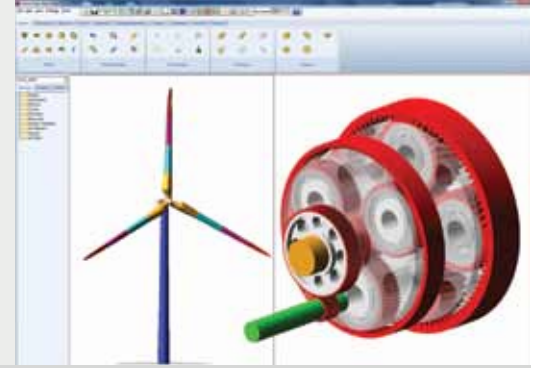


AdWiMo

Advanced Windturbine Modeling



Overview

An acronym for Advanced Wind Turbine Modeling, AdWiMo allows fast modeling and accurate system simulation of wind turbines. AdWiMo considers every major aspect of turbine design including tower, blades, hub, mainframe, gearbox housing, bearings, transmission, controls (generator, pitch, yaw), aerodynamic and centrifugal forces, coriolis acceleration, gyroscopic moments, point loads, gravity, thermal loads, and wave loads from 3rd parties.

AdWiMo is an Adams plug-in with all the necessary features to assemble a complete and parametric wind turbine and to simulate single or multiple wind fields. Adams is the most widely used multibody dynamics simulation software. Numerous interfaces to CAD, to finite element software and to third party products make Adams and AdWiMo a platform for enterprise engineering processes. All features of Adams remain accessible to the AdWiMo user.

The tool offers a user-friendly and scalable solution for the complete design process of a wind turbine. This means, that a simplified wind turbine from the conceptual design phase can be expanded with more complex subsystems such as gears and rolling bearings and/or by replacing rigid bodies with flexible bodies. AdWiMo's scripting allows changing all relevant simulation parameters to check against normal or extreme wind conditions, fault situations, special controller conditions, and many more behaviors.

AdWiMo builds on MSC Software's expertise in Computer Aided Engineering (CAE). The tool gives users a single software tool for creating an all-in-one model of the whole wind turbine that supports different levels of detail. AdWiMo leverages MSC Software's knowledge of composites and builds on calculation methods the company has used to deliver solutions to major players in the automotive and aerospace industries.

AdWiMo

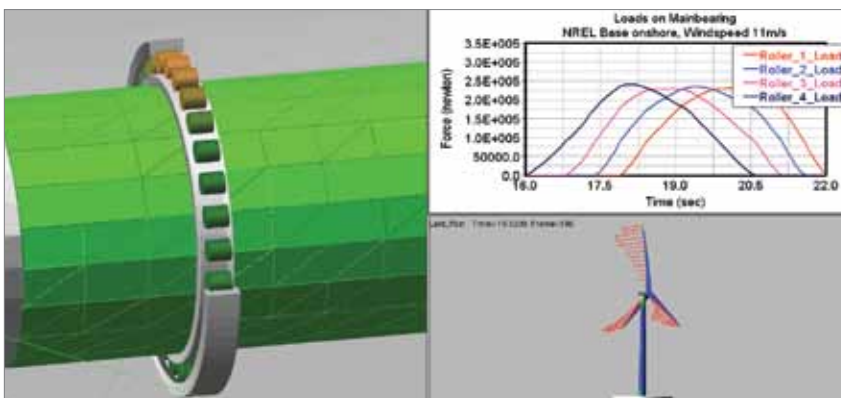
AdWiMo includes all necessary features to assemble a complete and parametric wind turbine and to simulate single or multiple wind fields.

AdWiMo is based on Adams, which is the most widely used multibody dynamics program in the world. Numerous interfaces to CAD, to finite element software and to third party products make Adams and AdWiMo an ideal platform for enterprise engineering processes. All features of Adams remain accessible to the AdWiMo user.

AdWiMo offers a user-friendly and scalable solution for the complete design process of a wind turbine. This means, that a simplified wind turbine from the conceptual design phase can be expanded by more complex sub-systems such as gears and rolling bearings and/or by replacing rigid by flexible bodies.

Capabilities

- One software tool for the whole turbine
- One All-In-One model with different levels of details
- All components are embedded in a full turbine system
- Every component easy replaceable and flexible
- Full interaction of all components including wind
- Transient dynamic analysis
- Control strategies can be applied
- Open for all types of turbines and new designs
- Reduction of needed software portfolio at user site
- Reduced investment and training on software
- Fast computation allowing efficient design studies
- Full MSC Adams capabilities
- GUI with many useful features



The Target Application - Complete Wind Turbines

...offshore or onshore. Switchable detail levels up to consideration of every major aspect of the design including flexible and interacting detailed components.

The Background - MSC's Expertise

...in Computer Aided Engineering (CAE). The tool gives users a single software tool for creating an all-in-one model of the whole wind turbine that supports different levels of detail. AdWiMo leverages MSC Software's knowledge of composites and builds on calculation methods the company has used to deliver solutions to major players in the automotive and aerospace industries. Moreover AdWiMo exploits crucial synergies resulting from MSC Software's long standing collaboration with universities and research centers.

MSC Considers Every Major Turbine Design Aspect:

Loads:

- Wind
- Component Reactions
- Waves
- Construction

Structure:

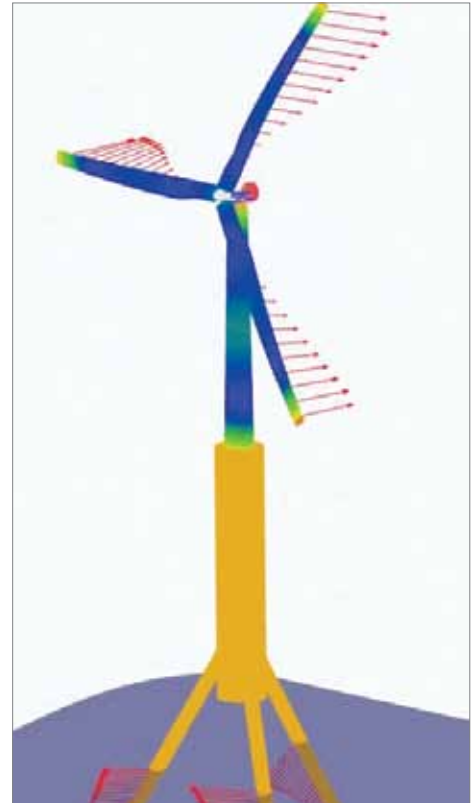
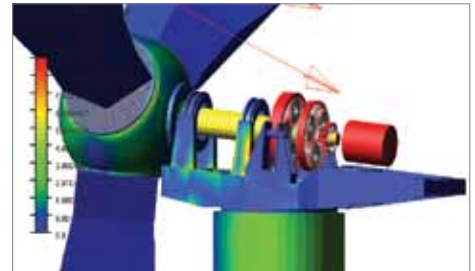
- Blades
- Components (Hub, Shafts, etc.)
- Gears
- Bearings
- Housing
- Tower

Behaviour:

- Dynamics
- Statics
- Linearized models
- Controls
- Fatigue

Evaluation:

- Gear Life
- Bearing Life
- Fatigue Life
- Certification Requirements
- Stresses and Strains



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