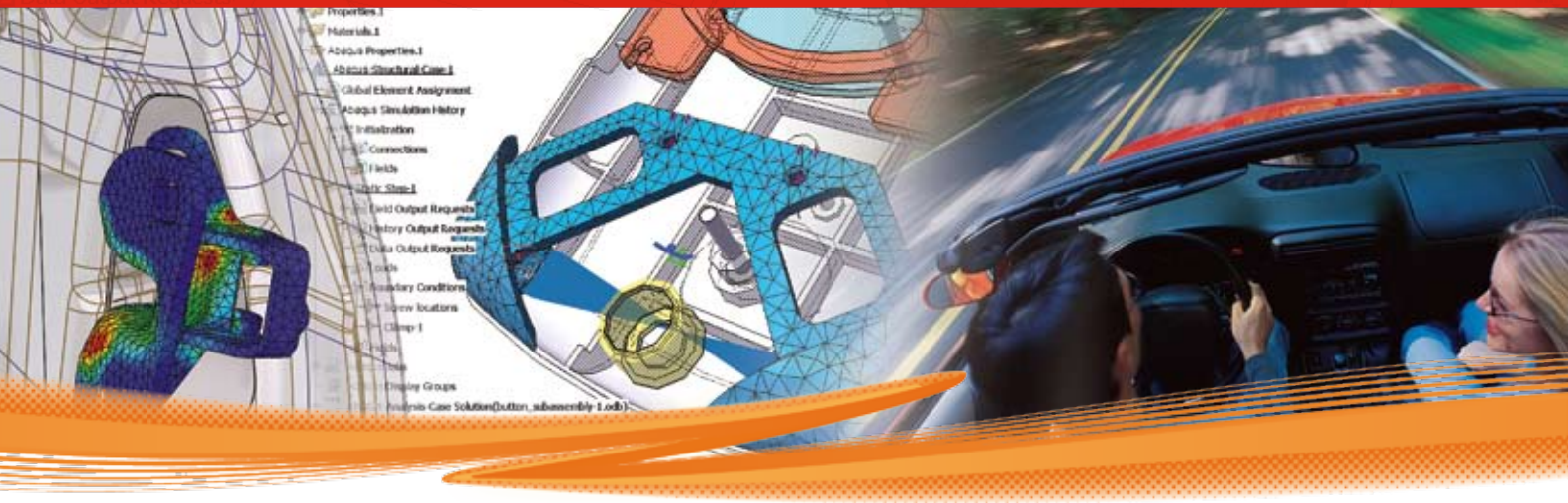


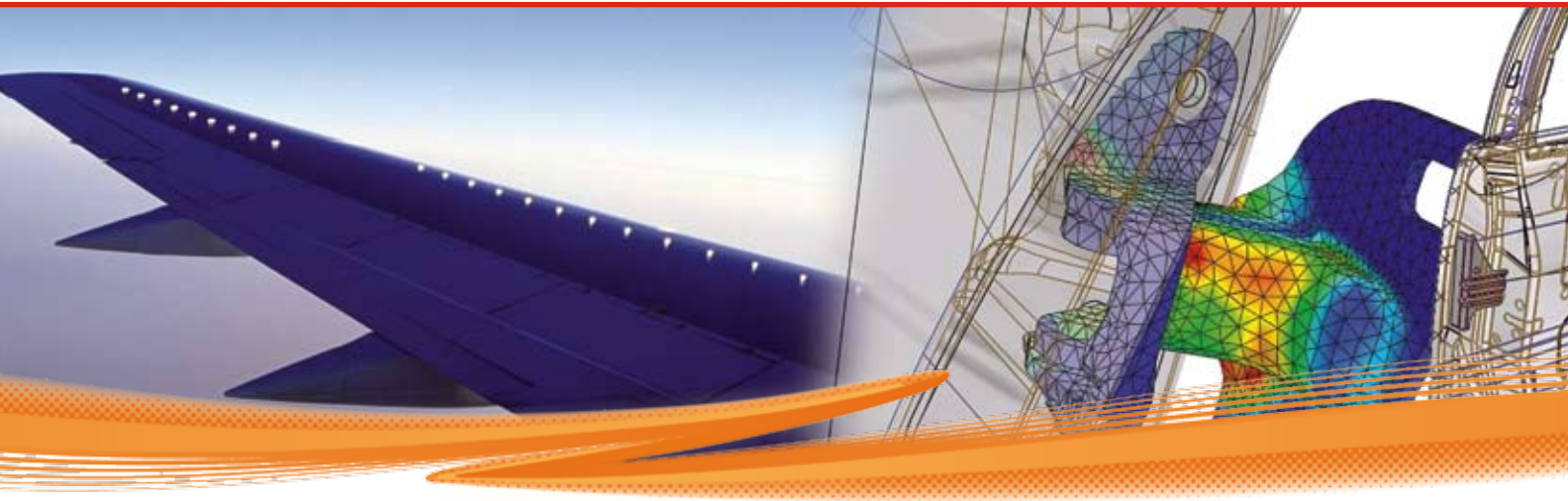
SIMULIA Extended Analysis

Nonlinear and Thermal Analysis for CATIA V5



Nonlinear and Thermal Analysis for CATIA V5

Extending the CATIA V5 Analysis Products to Include Basic Nonlinear and Thermal Analysis



When Linear Analysis Is Not Enough

The existing CATIA Analysis products are ideal for designers who want to evaluate their designs, but are limited to the linear structural response of parts and assemblies. Many products are subject to both thermal and structural loads, or are made of materials like rubber that are inherently nonlinear. Designers may also want to study the effect of overload conditions when the product might suffer permanent deformation.

Extended Analysis Capabilities for Designers

SIMULIA Extended Analysis addresses this need with the introduction of two analysis products, Nonlinear Structural Analysis (ANL) and Thermal Analysis (ATH). These products are intended for designers looking to accurately size designs and quickly evaluate real world performance.

To access the basic nonlinear and thermal analysis capabilities included in Nonlinear Structural Analysis (ANL) and Thermal Analysis (ATH), users must first be working with Generative Part Structural Analysis (GPS), the backbone product to the CATIA V5 Analysis offering. The GPS structural capabilities will be extended to include nonlinear effects that enable more realistic simulation, such as nonlinear material characteristics, large deformations, and advanced contact. Users who want to analyze nonlinear structural and thermal assemblies also need to be working with Generative Assembly Structural Analysis (GAS) before adding ANL and ATH.

Benefits

SIMULIA Extended Analysis lets designers extend their product simulation capabilities to consider permanent material deformation, large displacements, and advanced contact, as well as response to thermal loading.

Key benefits include:

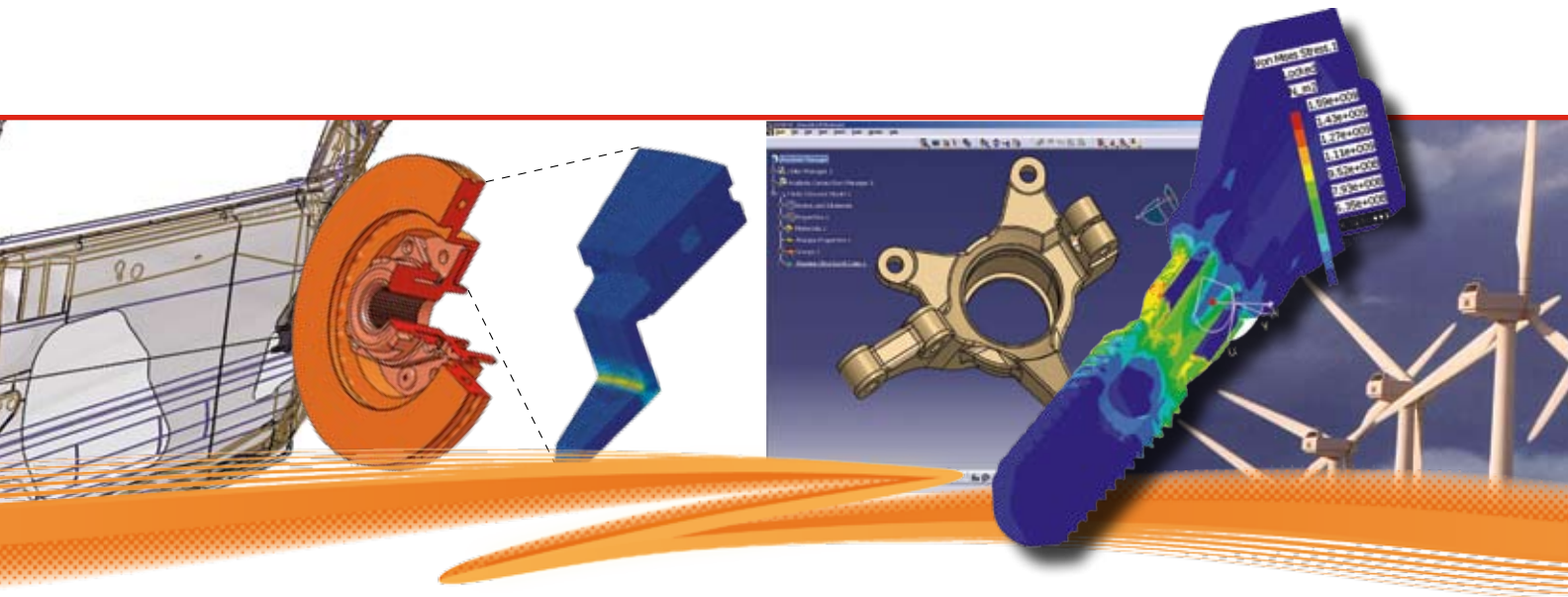
- Extension of the CATIA V5 Analysis capabilities.
- Nonlinear effects for more realistic simulation of material behavior, large displacements, and contact.
- Thermal studies including thermal-stress effects.
- Internal utilization of Abaqus technology.
- Availability on parts and assemblies.

Thermal Analysis

Thermal Analysis (ATH) calculates the temperature distribution of a part or assembly in response to the direct heating of a surface, the flow of a fluid past a surface, or the specified temperature of the surface.

Key Features

- Steady-state and transient analysis
- Material properties can be temperature dependent
- Thermal loading
- Heat conduction within an assembly

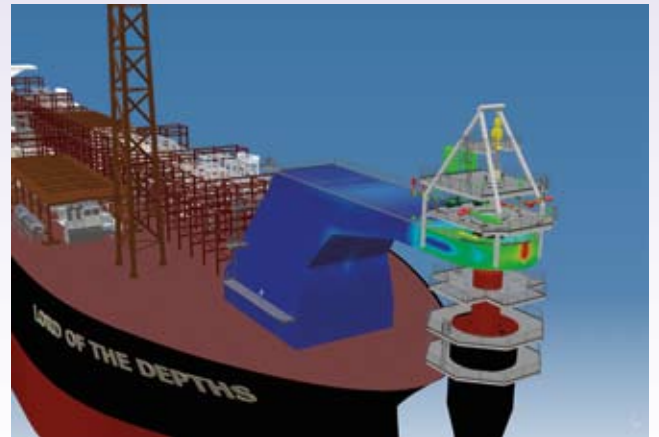


Nonlinear Structural Analysis

Nonlinear Structural Analysis (ANL) enables more advanced simulation that includes nonlinear effects, such as large displacements and material nonlinearity. Material plasticity, typical of metals, can be modeled, as can the nonlinear elasticity in hyperelastic materials like rubber.

Key Features

- Nonlinear static analysis
- Large displacements
- Nonlinear materials
- Multi-step analysis
- Natural frequency analysis including preloading effects
- Advanced contact
- Thermal stress analysis



This model shows the support tower for the turret of a Floating Production, Storage and Offloading (FPSO) vessel. Nonlinear Structural Analysis (ANL) was used to capture nonlinear behavior due to large displacement and capture stress behavior past the material yield point.

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About SIMULIA

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