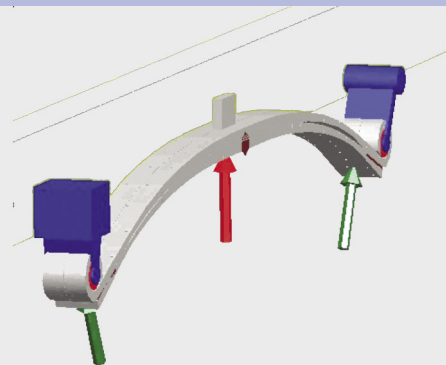


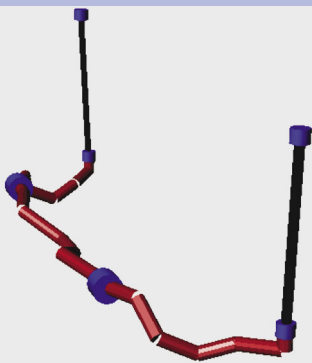
New SIMPACK Release 8.6



Flexcoil spring (SIMBEAM model)



Leaf spring (SIMBEAM model)



Anti roll bar (SIMBEAM model)

INTEC released the new major version SIMPACK 8.6 just in time for the SIMPACK User Meeting 2003. SIMPACK 8.6 is an evolution of version 8.5. In addition many customer driven developments were brought in, giving the new release even more functionality.

With SIMPACK 8.5, released in December 2001, the architecture of SIMPACK was changed significantly including the substitution variables, user routines and the dynamic allocation of memory. The restructuring of these features has been continued along with providing increased functionality. The development of SIMPACK 8.6 began in the middle of February 2002 and contains more than 300 new developments, which include customer and technology driven enhancements, as well as bug fixes. SIMPACK 8.6 doesn't just offer new improvements and enhancements over SIMPACK 8.5, but includes entirely new modules.

NEW PRODUCTS IN 8.6

FlexContact

A new contact functionality *Curve to Curve* contact on flexible bodies has been developed. FlexContact works on the basis of moved markers.

MATSIM

The interface for importing Simulink models into SIMPACK.

- import as C-Code Dynamic Link Libraries (DLL), which is exported to SIMPACK using the RealTime Workshop

SIMBEAM

Definition of flexible Euler/Bernoulli Beams within SIMPACK:

- spatial beam framework structures (forks and junctions are supported)
- automatic creation of graphical representation
- element types are Euler/Bernoulli Beams, rigid elements with and without mass

LOADS for FEMFAT:

This Module opens the way for fatigue analysis with FEMFAT of finite element bodies, which are embedded in the SIMPACK simulation.

DMU Export

- This interface supports the export of transient and modal results to Digital MockUp environments
- Supported is the export of rigid and flexible bodies to Centric Studio

RAIL SWITCHES

- preprocessor for handling of s-variable profiles
- example model of a standard switch type "EW 60 300 1/9"
- separate back of wheel contact used for guard and check rails

EXTENDED FUNCTIONALITIES

The main highlights of SIMPACK 8.6 are as follows.

CONTACT

A new curve on curve contact element has been created. The Contact is based on the curve intersection algorithm. It solves multi point contact problems of two dimensional surface shapes and calculates the resulting contact forces from the depth of the areas of penetration.

FEMBS

The FEMBS module now supports *Moved Markers* on flexible bodies. The area of application has been extended with the FBI converter available for the FE codes ABAQUS and IDEAS. The Nastran dmap is also supported.

NVH

This module now has the functionality available to perform the frequency response calculation for non-linear systems and automatically carry out the Fourier coefficients for amplitude and phase, dependent on the frequency order.

SIMAT

The auto start function of SIMAT makes it easy to perform a co-simulation with MATLAB Simulink. The co-simulation solver of SIMPACK now supports inverse dynamics for constrained systems with only one degree of freedom.

USER ROUTINES

The functionality of USER Routines has been improved once more: force elements now offer q-states. Multi point force elements are also supported. The set of access functions has been extended, it is now possible to check the solver mode and the solver state. In connection with comprehensive root function control functionalities, the USER Routines don't set any limits to the programmers creativity. With the help of database elements and external DLLs, working with SIMPACK USER Routines is particularly user-friendly.

WHEEL/RAIL

The Wheel/Rail Pre-processor has been redesigned so the handling of s-variable profiles is much easier. Mirroring of profiles is now standard. User friction templates are now available. The coefficient of friction may now be simultaneously dependent on the distance along the track and on the contact point location of the wheel profile.

CODE EXPORT

The unique SIMPACK Code Export (CE) Module has been re-designed and expanded by a variety of new functionalities. CE supports most of the SIMPACK library elements including Automotive Elements like Tyres, and Track-Joints. The Data Base can be used for addressing input functions (and sets), IPF arrays and tracks. One of the most important enhancements is the parameterisation of the exported model. Also, flexible bodies can now be exported. A transparent licencing and maintainable library export concept has been added for the runtime use of exported models. SIMPACK

Code Export is the vehicle for exporting mechanical models to external mechatronic applications.

COMMAND LINE INTERFACE

All solver modes of SIMPACK can now be executed from the command line. Also result export to ASCII files and result comparison can be started from the command line.

SOLVER

The core of SIMPACK, the solver, has again been sped up with calculation times reduced. For better control of the accuracy of the solver, absolute and relative velocity tolerances may be defined for individual state variables and for groups of state variables via the GUI. The results of the static equilibrium and nominal force calculation can now be written to an additional file.

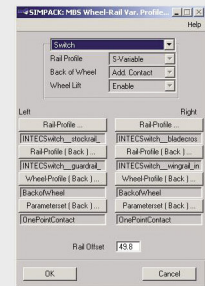
POST PROCESSING

The eigenmode analysis now offers two new animation and plotting features:

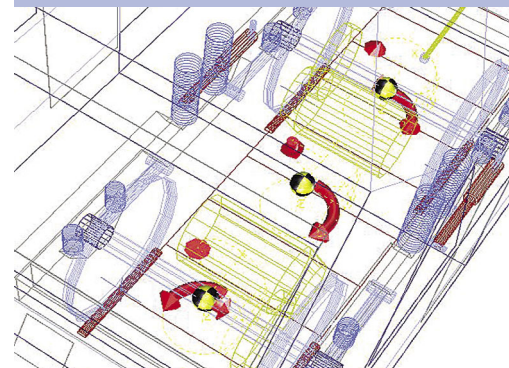
- Eigenvector polar plots for the characterisation of eigenmodes
- Animated arrows within the G3D mode shape animation

Another nice feature is the *Result Comparison* of two different SIMPACK runs using the general plot module. Last but not least, a zoom in /zoom out functionality has been introduced.

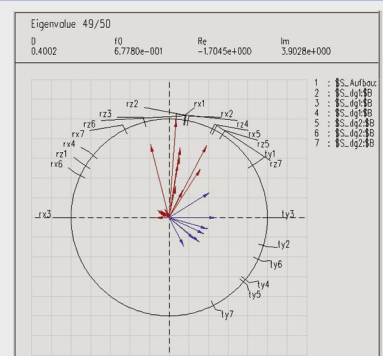
By leveraging the powerful architecture of SIMPACK 8.5 we were able to incorporate many customer requirements, create six new modules and further increase of the usability in a very short time without scarifying quality.



Rail Switches profile selection



Arrow representation of an out of phase wheelset mode



Polar diagram sinusoidal railway vehicle mode