

Latest News

SIMPACK CHAINS

The SIMPACK chain module, successfully rolled out in 2005, has been expanded to support flexible chain guides. Whereas traditional chain simulations would not allow to incorporate the flexibility of the chain guides, SIMPACK now offers this capability.

The tensioners and guides are defined as standard flexible bodies through the SIMPACK flexible body interface FEMBS. The contact surface is then connected to the flexible body by selecting the proper markers along the body's surface.

This functionality is available as part of the SIMPACK Chain Drive module starting with SIMPACK version 8.714.

ENHANCEMENTS TO FORCE ELEMENT FE 225 GEAR PAIR

The function Dynamic Transmission Error has been added to the output values of the Gear Pair Force Element. The dynamic transmission error (DTE) returns the kinematic transmission error of the gear pairing along the line of action.

The kinematic and elastokinematic errors that occur with perfect gear pairs can be attributed to the following:

- Changes to the axial displacement during transmission due to the elasticity in the mounts and the bending of the shafts.
- Pulsating loads.
- Pulsation contact stiffness due to the multi-tooth contact, taking the contact ratio into consideration.

These effects are shown by the function Dynamic Transmission Error. The dimension of which is length and can be interpreted as the equivalent geometrical penetration of the tooth during meshing.

NEW CO-SIMULATION FEATURES

The SIMPACK Co-Simulation module was expanded with a set of new features.

Two SIMPACK models can now be run in co-simulation with each other, i.e. a

co-simulation SIMPACK-SIMPACK. In this co-simulation mode the respective u- and y-vectors are made consistent automatically before the actual co-simulation is performed.

Initial „states“ for the u-vectors can now be defined in a SIMPACK model. In addition while co-simulating, the u-vector can be extrapolated. This leads to more robust and stable co-simulations especially when using relatively large communication steps. Also a new GUI was implemented for specifying the co-simulation configuration.

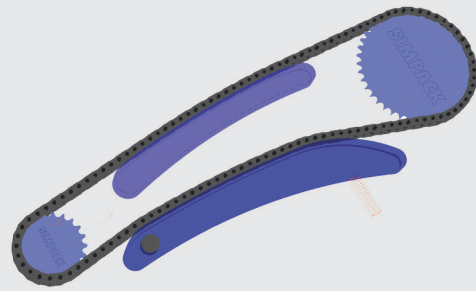
NEW SIMPACK FEATURE MEASUREMENT CONFIGURATION

Within the setup GUI users can now specify the measurement configuration to be used when executing the SIMPACK solver with measurements activated.

The user can specify what type of result files are to be generated, e.g. sbr files and animation files, and whether the measurements should be generated during the solver run or after the solver run (online or offline measurements).

In addition, when using sbr files, the user can specify for which elements measurement data should be generated, e.g. for force elements and result elements.

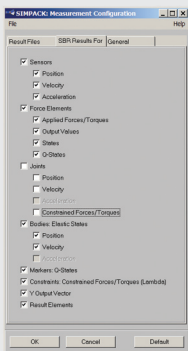
Also, for sbr files, the start and end time for the measurement run as well as the output step can be set independent of the solver settings. Typical application for this would be if only part of a solver run is needed for plotting or if initial system settling oscillations should be omitted from the measurement data. This functionality is available with SIMPACK version 8.714 onwards.



SIMPACK Chain



SIMPACK Gear Pair



SIMPACK Measurement Configuration

DAMPING OF FLEXIBLE BODIES

In SIMPACK's interface with FEA-software FEMBS the user can define the damping behaviour of flexible bodies, by specifying either the stiffness proportional damping (natural damping) or the critical damping (modal damping) for each mode. The damping coefficients based on these specifications are written out to the SID file, which represents the flexible body in SIMPACK. With the upcoming SIMPACK release the user can easily modify the damping specification in the model-setup GUI, without starting FEMBS again. This enables the parameter variation of structural damping in SIMPACK. Figure 1 shows the new body definition window with a modified damping value.

LOADS DURABILITY FOR NASTRAN

Since SIMPACK 8.5 LOADS DURABILITY, in combination with the FEA-Solver ANSYS and the fatigue-software FEMFAT, enables fast fatigue life calculations based on a MBS Simulation with high accuracy for long simulation periods. The modal approach, which is used in this context, can calculate the stresses precisely with a small number of degrees of freedom. With the next SIMPACK release LOADS DURABILITY is also available for the FEA-software NASTRAN in combination with FEMFAT. An import of the NASTRAN results for modal stress calculations in SIMPACK will be added soon.

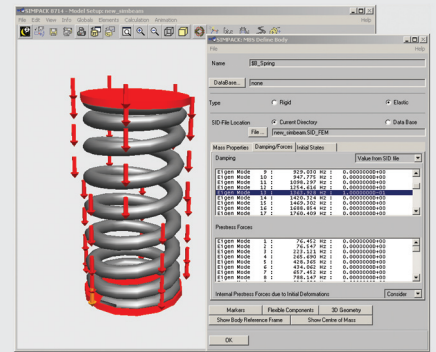


Figure 1 Body Definition Window with Modified Damping Values