Adams
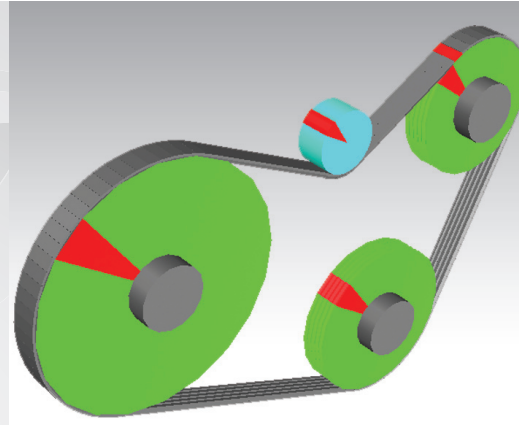## Engineering Productivity through Advanced Multi-body Simulation

Adams

Adams is the world's most widely used mechanical system simulation software. It lets you build and test virtual prototypes, realistically simulating on your computer, both visually and mathematically, the full–motion behavior of your complex mechanical system designs.

Adams 2008r1 provides a robust solution engine to solve your mechanical system model. The software checks your model and automatically formulates and solves the equations of motion for kinematic, static, quasi-static, or dynamic simulations.

With Adams, you don't have to wait until the computations are complete to begin seeing the results of your simulation. You can view animations and plots – and continue to refine your design – even as your simulations is running, saving valuable time.

For design optimization, you can define your variables, constraints, and design objectives, then have Adams iterate automatically to the design, providing optimal system performance.

Modeling

The Adams/View interface and point-and-click operation make it easy for even novice users to create complete, accurate mechanical models. Drag-and-drop positioning lets you sketch a rough model without having to define numerical coordinates at every step.

With Adams/View, you build a model the same way you build a physical system – by creating and assembling parts, connecting them with joints, and driving them with motion generators. You can also define forces, such as springs or friction, and apply them between individual parts in your full system design. You can also give your Adams model parametric properties, enabling you to select a design variable, sweep it through a range of values, and initiate a set of parametric simulations to study design sensitivities.

If you choose to build your model in your preferred CAD environment, you can import its geometry directly into Adams through any of the industry standards interfaces provided by the optional Adams/Exchange module.

Visualization

An important advantage of virtual prototyping is the ability it gives you to easily modify design variables and instantly visualize the effects of these design changes on total system performance. Adams OpenGL graphics port allows fast high-quality animation and detailed plotting for viewing the results of your simulation. You can animate your model in wire frame or shaded modes, and isolate a single frame or superimpose a series of images.

Adams then lets you plot the model's behavior (displacements, velocities, accelerations, forces) and compare the results to other simulations.

Capabilities

- Creation or import of component geometry in wireframe or 3D solids
- Extensive library of joints and constraints to define part connectivity
- Internal and external forces definition on the assembly to define your product's operating environment
- Model refinement with part flexibility, automatic control systems, joint friction and slip, hydraulic and pneumatic actuators, and parametric design relationships
- Ability to iterate to optimal design through definition of objectives, constraints, and variables
- Automatic generation of linear models and complex loads for export to structural analyses
- Comprehensive linear/nonlinear results for testing complex, large-motion designs
- Superior contact capabilities supporting 3D contact between modal flexible bodies and solid geometry

High Performance Computing (HPC)

- 64-bit support on Windows and Linux platforms
- Parallel processing support for Adams/Tire results
- Shared Memory Parallel solver
- Obtain nonlinear results for testing complex, large-motion designs

MSC Software

Adams Package Modules

The following modules enhance the capabilities of Adams by allowing the simulation of systems ranging from simple to sophisticated.

Adams/Flex

Adams/Flex allows the incorporation of component flexibility within your full-system simulations. Adding flexibility provides better insight into the behavior and life of your designs, allowing you to deliver higher quality products faster. Adams/Flex allows the use of existing linear FE models and is tightly integrated with Nastran and Patran.

Adams/Durability

Adams/Durability extends the capability offered by Adams/Flex to recover stresses on flexible bodies. Results from an Adams solution are combined with modal stresses from FE to more accurately predict the stress in a flexible body. These stresses and strains can then be used to complete a life/damage calculation with fatigue prediction software such as Fatigue.

Adams/Vibration

Adams/Vibration allows you to study forced vibration of your Adams models using frequency domain analysis. Adams/Vibration results can be used in NVH studies to predict the impact of vibrations on passenger comfort in an automobile, train, plane or other vehicle. You can also include the effects of controls on the system behavior
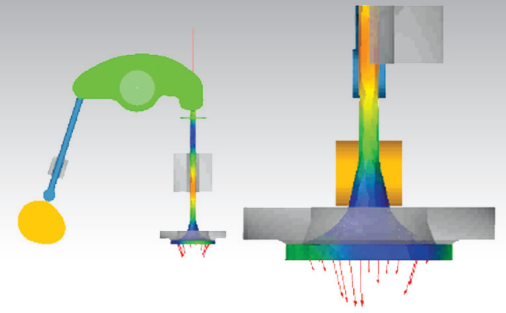
Adams/Controls

Adams/Controls helps you to easily integrate the worlds of motion simulation and control system design in true multidisciplinary fashion. With this module, you can incorporate your Adams models within block diagrams in your preferred control system design software. Alternatively, you can directly import actuators and/or controllers from the controls design software into the Adams simulation environment. Currently, Adams/Controls support Easy5 from MSC.Software and Matlab/Simulink from The Math Works, Inc.

Adams/Exchange

Adams/Exchange allows the import or export of common geometry formats into and out of Adams. There is no need to recreate model geometry each time you transfer data between CAE tools. You have a choice of Parasolid, STEP, IGES or DWG/DXF formats. When you import a model from your preferred CAD system, you can use the model's geometric features to quickly position forces and constraints for your motion simulation.

Adams/Tire FTire

Adams/Tire FTire software is an optional module that can be used to add tires to your mechanical model and to simulate maneuvers such as braking, steering, acceleration, free-rolling, or skidding. It lets you model the forces and torques that act on a tire as it moves over roadways or irregular terrain. You can use Adams/Tire to model tires for either vehicle-handling, ride and comfort, and vehicle-durability analyses.

Adams Package includes:

- Adams/Solver
- Adams/Linear
- Adams/View
- Adams/Flex
- Adams/Durability
- Adams/Vibration
- Adams/Controls
- Adams/Exchange
- Adams/Foundation
- Adams/Insight
- Postprocessor
- Shared Memory Parallel (SMP)
- Tire API

Optional Modules

- Adams/Tire FTire

ADM*2008JUN*DS