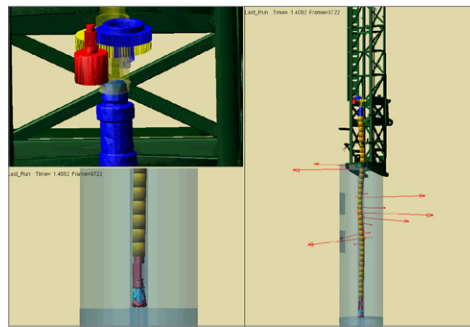


Adams Drill String Analysis Tool

TOOLKIT

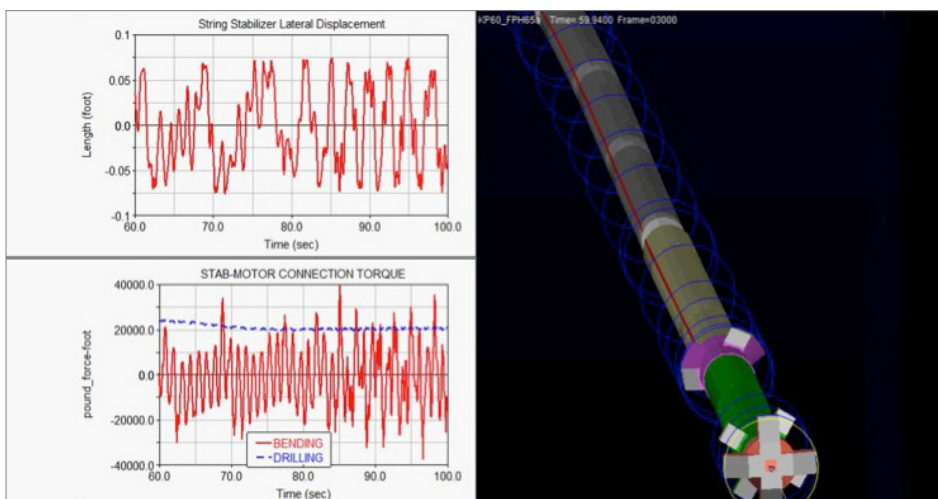
As the world's most famous and widely used Multibody Dynamics software, Adams improves engineering efficiency and reduces product development costs by enabling early system-level design validation. Engineers can evaluate and manage the complex interactions between disciplines including motion, structures, actuation, and controls to better optimize product designs for performance, safety, and comfort.



Along with extensive analysis capabilities, Adams runs significantly faster than traditional FEA methods, especially with system-level problems or mechanisms with moving parts. Users are capable of running Adams on an average laptop.

Adams/Drill is a toolkit we developed to predict the dynamic behavior of a drill string, including any non-Linear and fully coupled axial, lateral and torsional responses to various sequences of surface control parameters. It enables engineers to determine forces and motions at every location along the drill string in user-defined engineering units.

With fast dynamic simulation solutions in a matter of minutes, you will be able to assess the robustness of different drilling tool designs, and parametrically improve the model from actual drilling measurements.

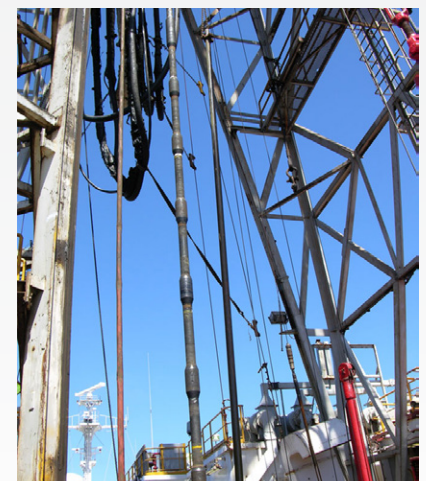
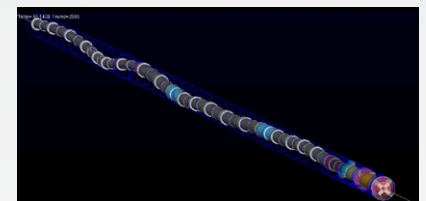


Software & Services Offerings

- How we Help**
 Engineering simulation software, implementation & support, modeling & analysis projects, methods development, and training
- Who we Help**
 Oil companies, suppliers, engineering services companies, universities
- How to Reach Us**
www.mscsoftware.com

Using Adams and Adams/Drill toolkit, engineers and analysts will be able to capture the realistic physics through generic or detailed modeling of:

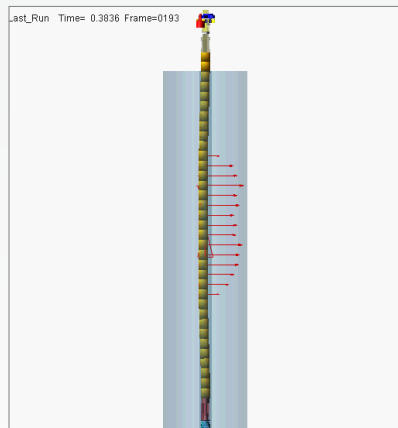
- Wellbore Path and Tortuosity
- Bit Formation Representation
- Mud Motor Representation
- Contact Forces
- Friction / Stiction
- Flexibility of Specified Components
- Directional Drilling
- Hydrodynamic Forces
- Temperature Effects on Properties
- Controls such as Surface Rotation Speed / Torque
- Weight-on-bit (movement of the block)



Here are some benefits that you would get using Adams:

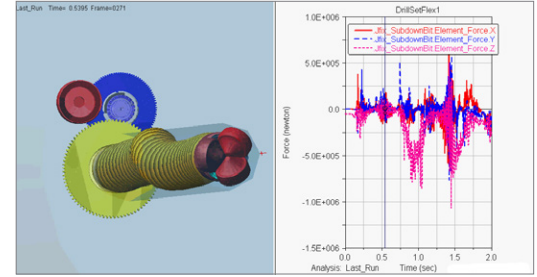
Leveraging Adams and Adams/Drill, you can confidently perform the following analysis (for Manufacturers, Directional Drilling, Services, Consultants, and Operators)

- BHA Optimization
- Vibration Alleviation
- Effects of Vibration inducing/absorbing tools on Drill String
- Assess loads and torques on down hole components / connections
- Create dynamic load cases for detailed FEA on down hole components / connections
- Optimize sensor placement
- Optimize drill string / mud motor RPM
- Validate effects of drilling enhancement tools on drill string vibration
- Bit design comparison
- Drill pipe comparison
- Analysis of advanced materials in downhole applications
- String Response to formation changes / inconsistencies
- Failures Analysis, Drill String Dysfunction
- Identify Natural Frequencies and critical Rotation speed
- Control system optimization
- Study Interaction of Surface systems with Drill String Dynamics

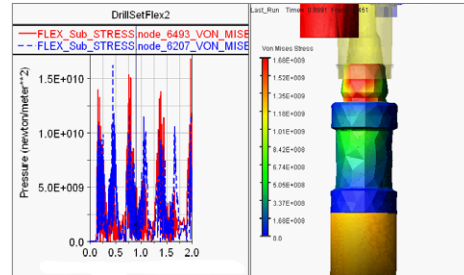


Vibration Analysis

Noise, vibration, and harshness (NVH) are critical factors in the performance of many mechanical designs but designing for optimum NVH can be difficult. Adams/Vibration allows engineers to easily study forced vibration of mechanical systems using frequency domain analysis.



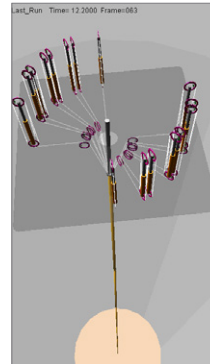
Durability Analysis



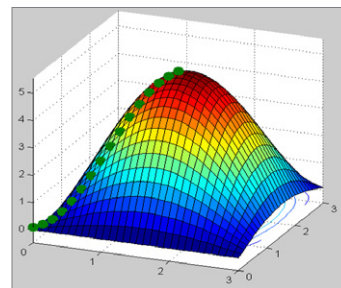
Durability testing is a critical aspect of product development and issues discovered late in the development cycle lead to project delays and budget overruns. Worse yet, “in service” failures lead to dissatisfied customers, safety issues, and warranty costs. Adams/Durability allows engineers to assess stress, strain or life of components within mechanical systems to design products to last.

Control System Integration

By using Adams/Controls, you can take your geometrically defined Adams models and easily incorporate them within block diagrams you have created with your preferred control system design software, such as EASY5, MATLAB Simulink or FMI supported tools. Similarly these types of models can be imported into the Adams environment.



Design Study, DOE and Optimization



Optimization analysis is important in every design process. Using Adams and Adams/Insight, your design team can quickly understand the simulation that was run, investigate which factors have the greatest effect on each response, easily make design changes, and immediately understand how these changes will affect the overall performance of your design.