

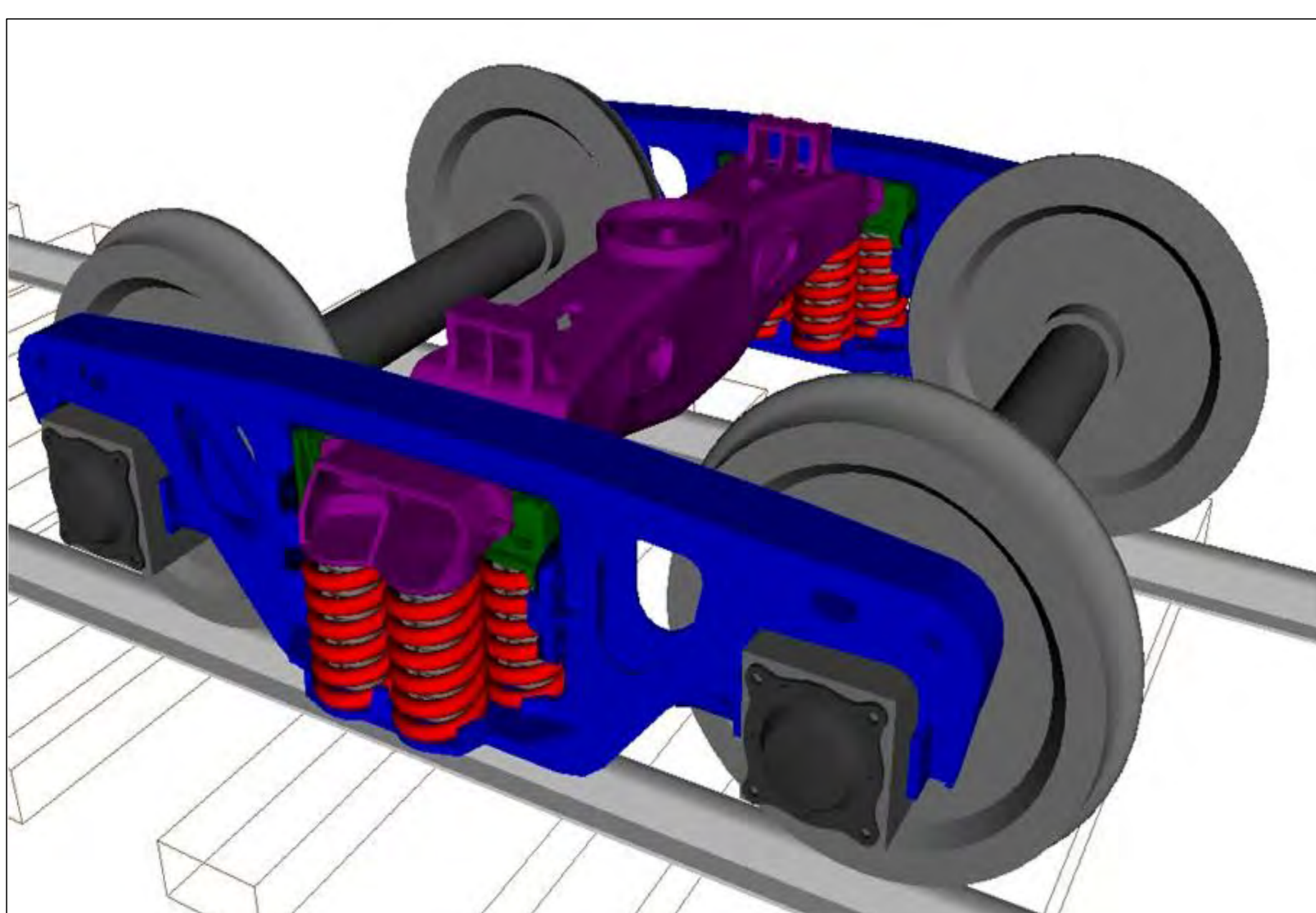
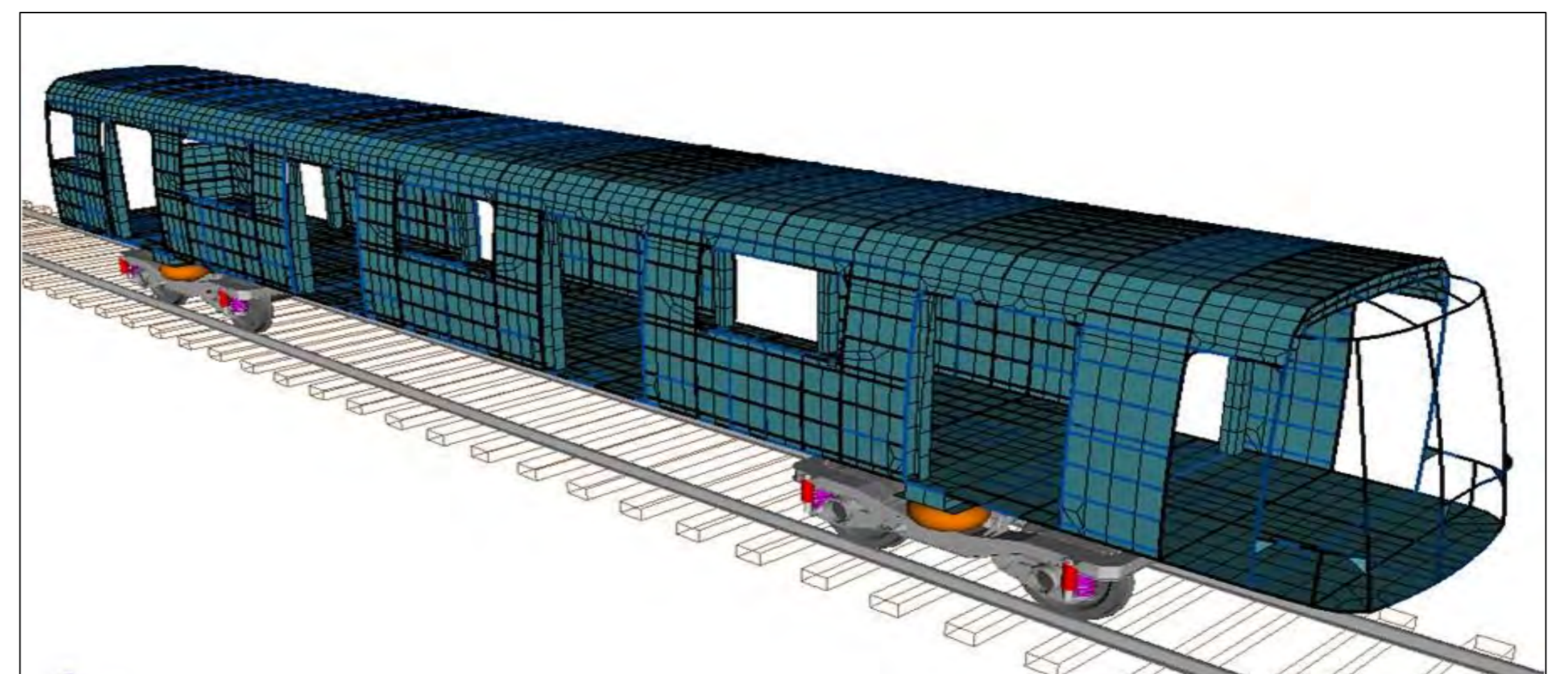
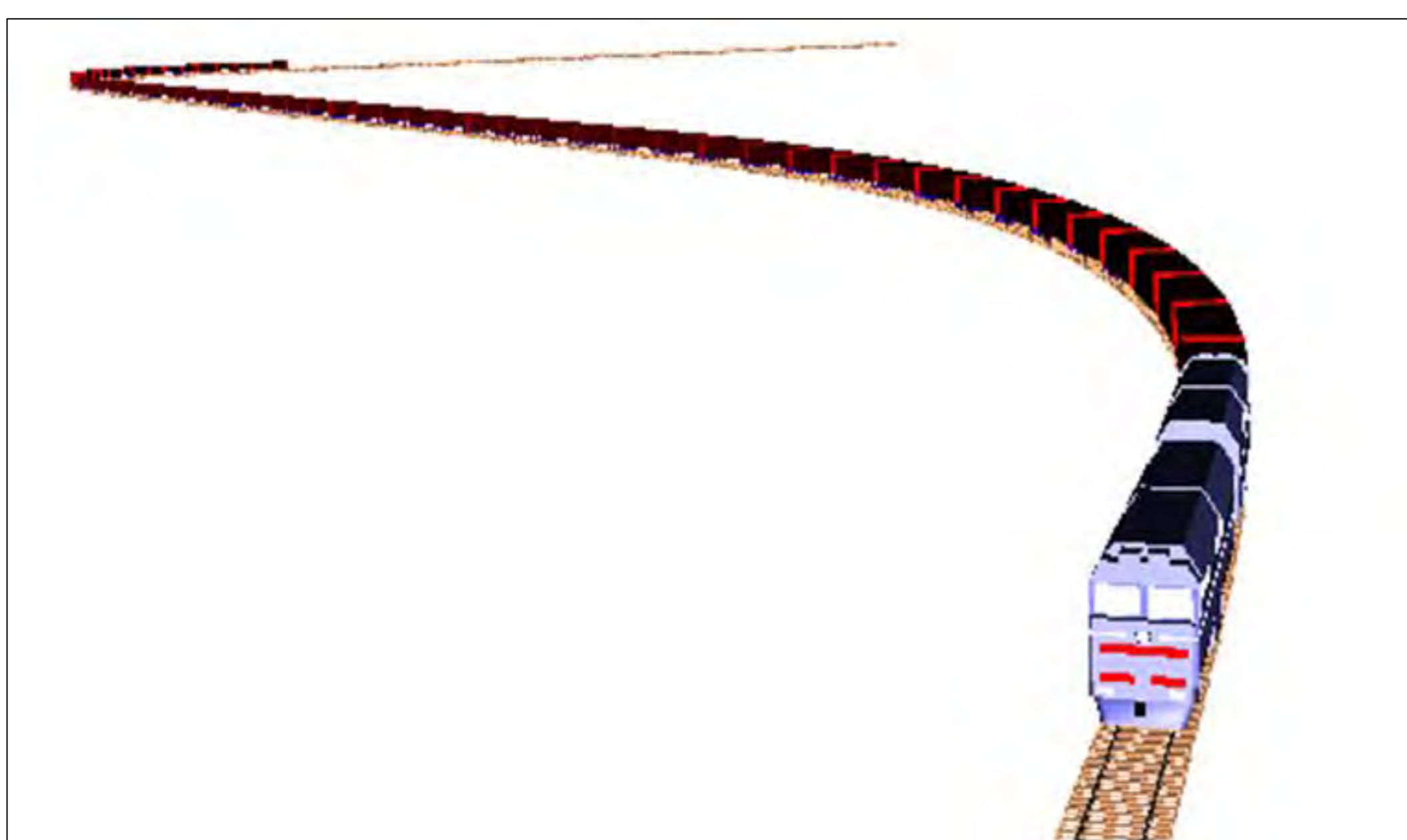
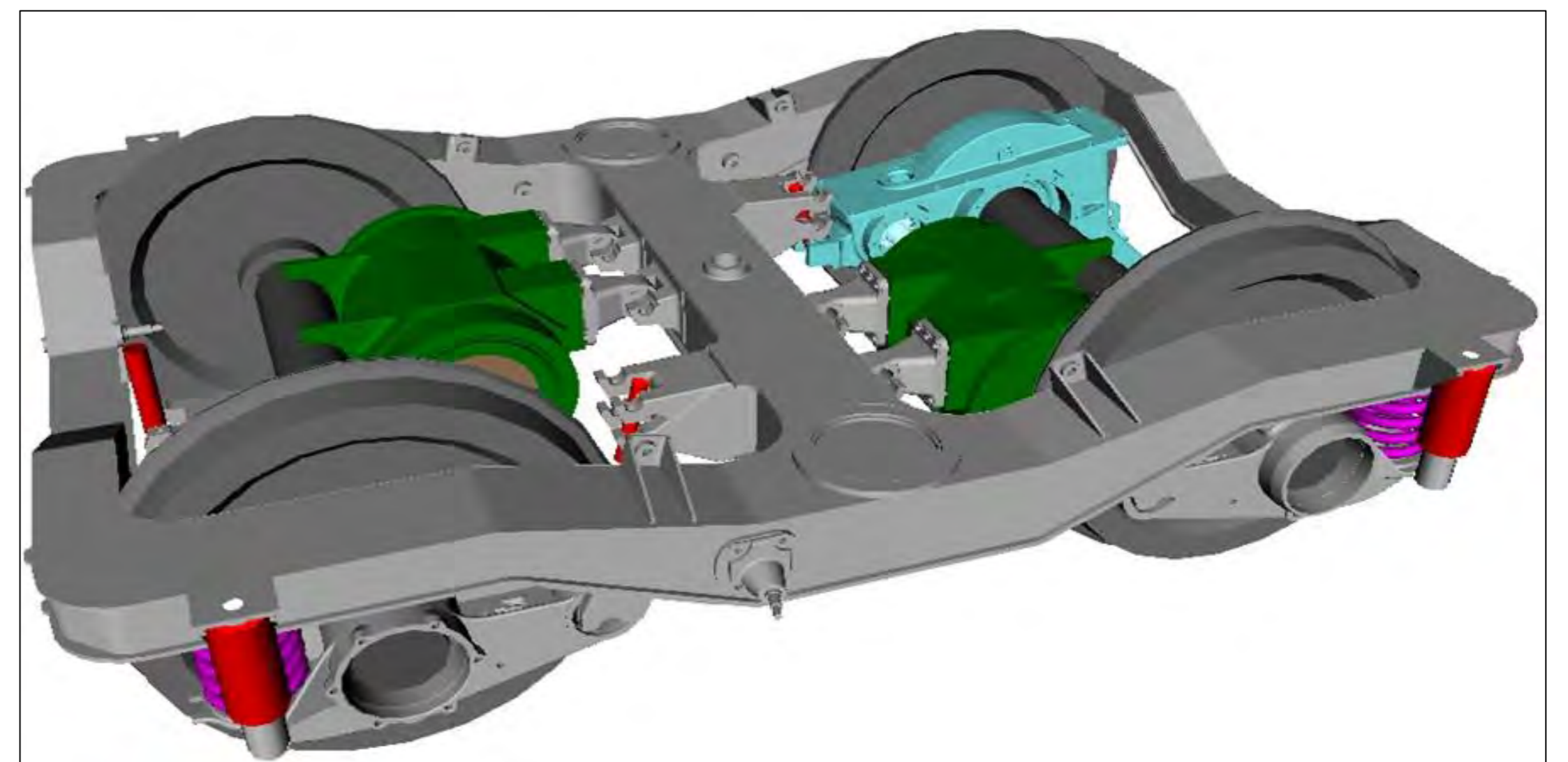
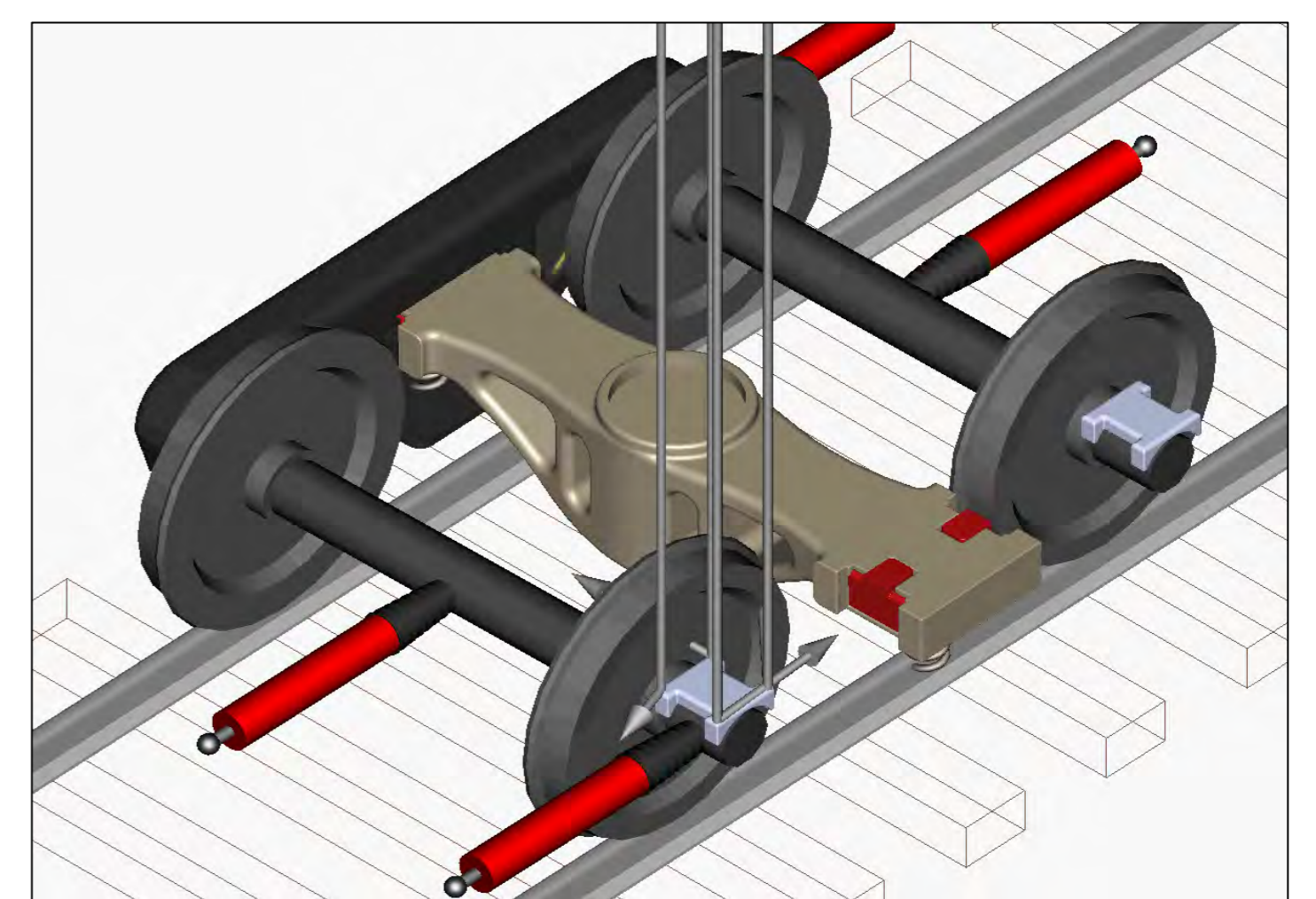
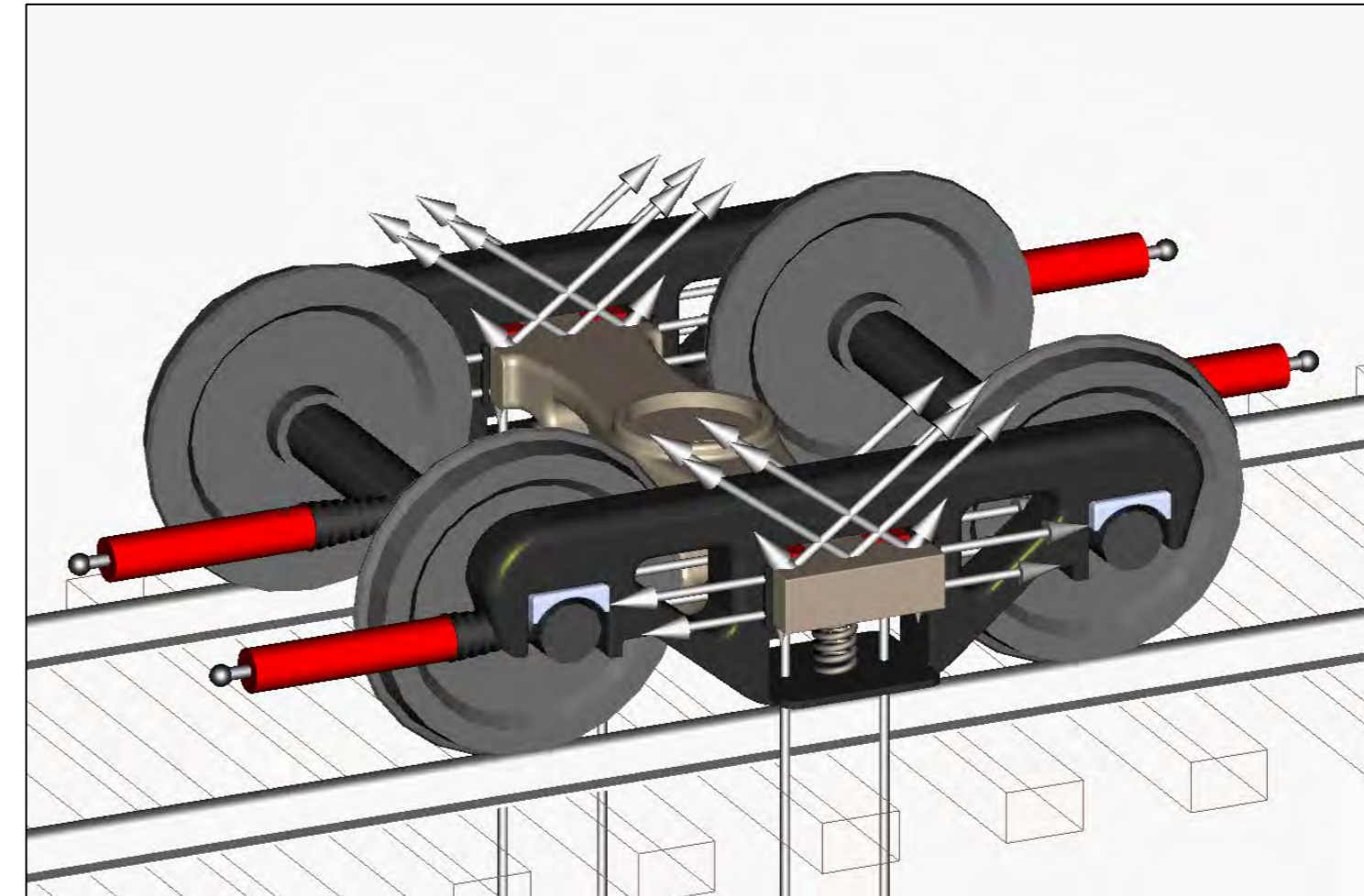
# UNIVERSAL MECHANISM

## SIMULATION OF RAILWAY VEHICLE DYNAMICS

Universal Mechanism software includes module for simulation of railway vehicle dynamics: locomotives, freight and passenger wagons, etc.

More than 40 models of various railway vehicles were created. There are diesel and electric locomotives, passenger cars, freight wagons, railcars, subway wagons and trams.

The module allows the user to calculate the critical speed, analyse 3D dynamics of a vehicle or a train in time domain on straight track or curves with/without irregularities, analyze vehicle dynamics depending on wheel and rail profiles, compute natural frequencies and modes as well as root locus, create hybrid rigid/flexible models of vehicles and then estimate stress state and damage sum.



## LIST OF ADDITIONAL MODULES

**UM Caterpillar** additional module for simulation of tracked vehicle dynamics.

**UM FEM** additional module for including flexible bodies into models. FE-meshes from ANSYS and MSC.NASTRAN are supported.

**UM Control** Matlab/Simulink interfaces. It gives a possibility to introduce Matlab/Simulink schemes (control, electrodynamics, hydraulics) into UM models.

**UM Durability** additional module for fatigue analysis.

**UM Train/Train 3D** additional module for simulation of a train longitudinal dynamics.

**UM Rai1/Wheel Wear** additional module for prediction of evolution of railway wheel profile due to wear.

**UM Ballast** additional module for simulation of dynamics of granular media systems in 2D.