



New type high-speed passenger truck design using Virtual prototyping technology

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Abstract



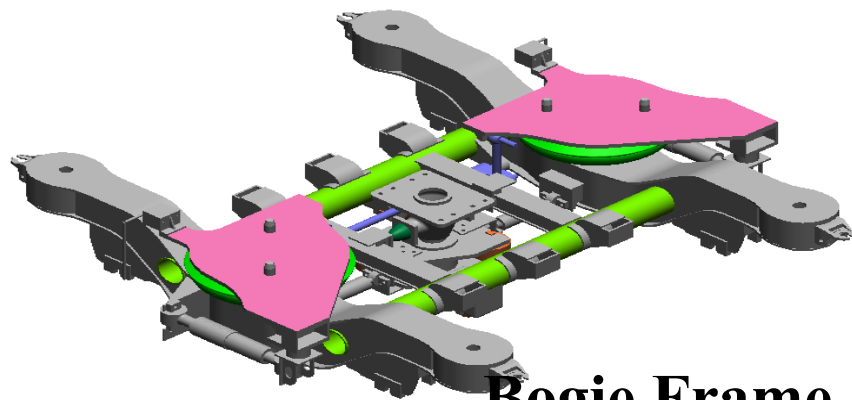
- Virtual prototyping technology is showing strong strength in the rail vehicle. A new high-speed truck is designed with UG, NASTRAN, ADAMS. Using UG, a bogie's 3D model is built, and put the model into PATRAN and FEA by NASTRAN. Dynamic simulation is made in ADAMS/rail. The result is satisfied, and make good consistent with the road test data. This vehicle type are running in China.
- **Key word:** Virtual prototyping technology, High speed railway vehicle, CAD, FEM, Dynamics simulation

1. Introduction

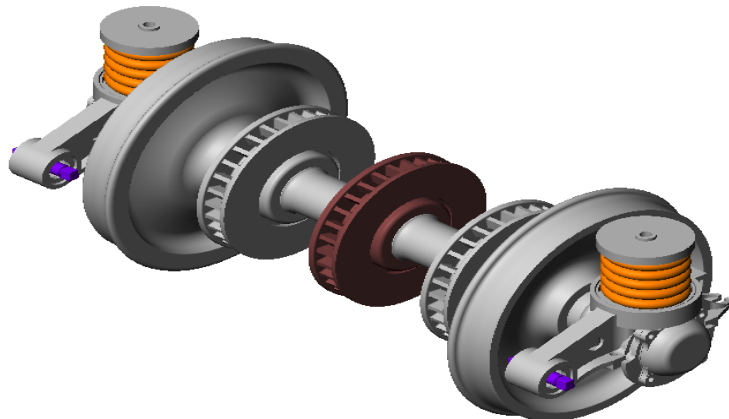


- Chinese rail need faster, more comfortable vehicles.
- New type high-speed truck need short design time, the technology have some difficulty.
- Virtual prototyping technology be an efficient method in design.
- This article introduce the design works of new type high-speed truck using virtual prototyping technology by UG, NASTRAN, ADAMS software.

2. Three Dimension Model

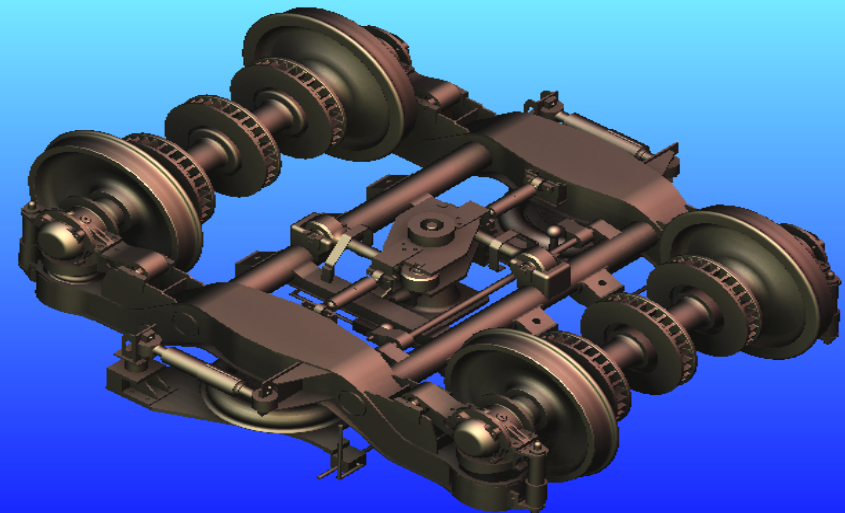


Bogie Frame



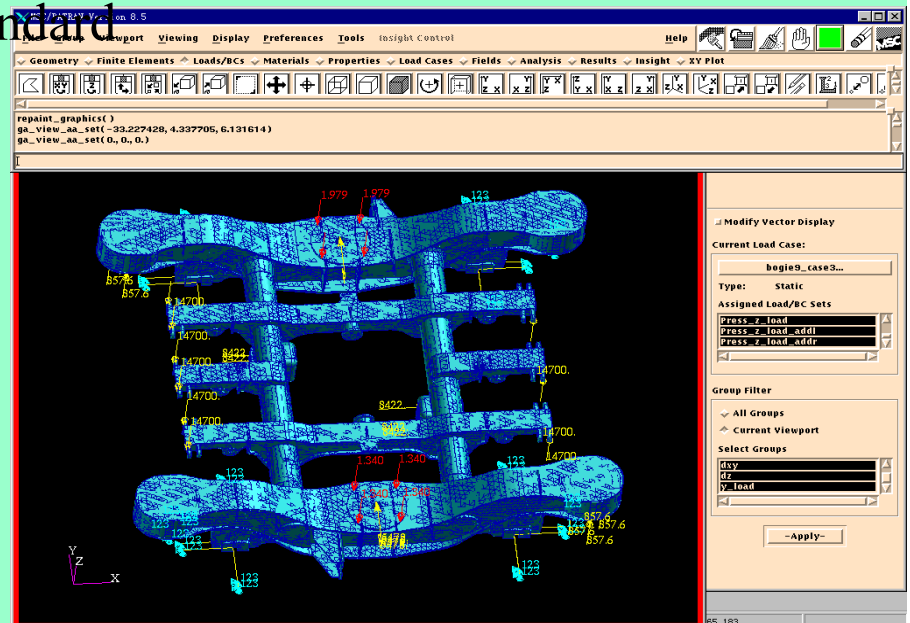
Wheelset and axlebox

Bogie

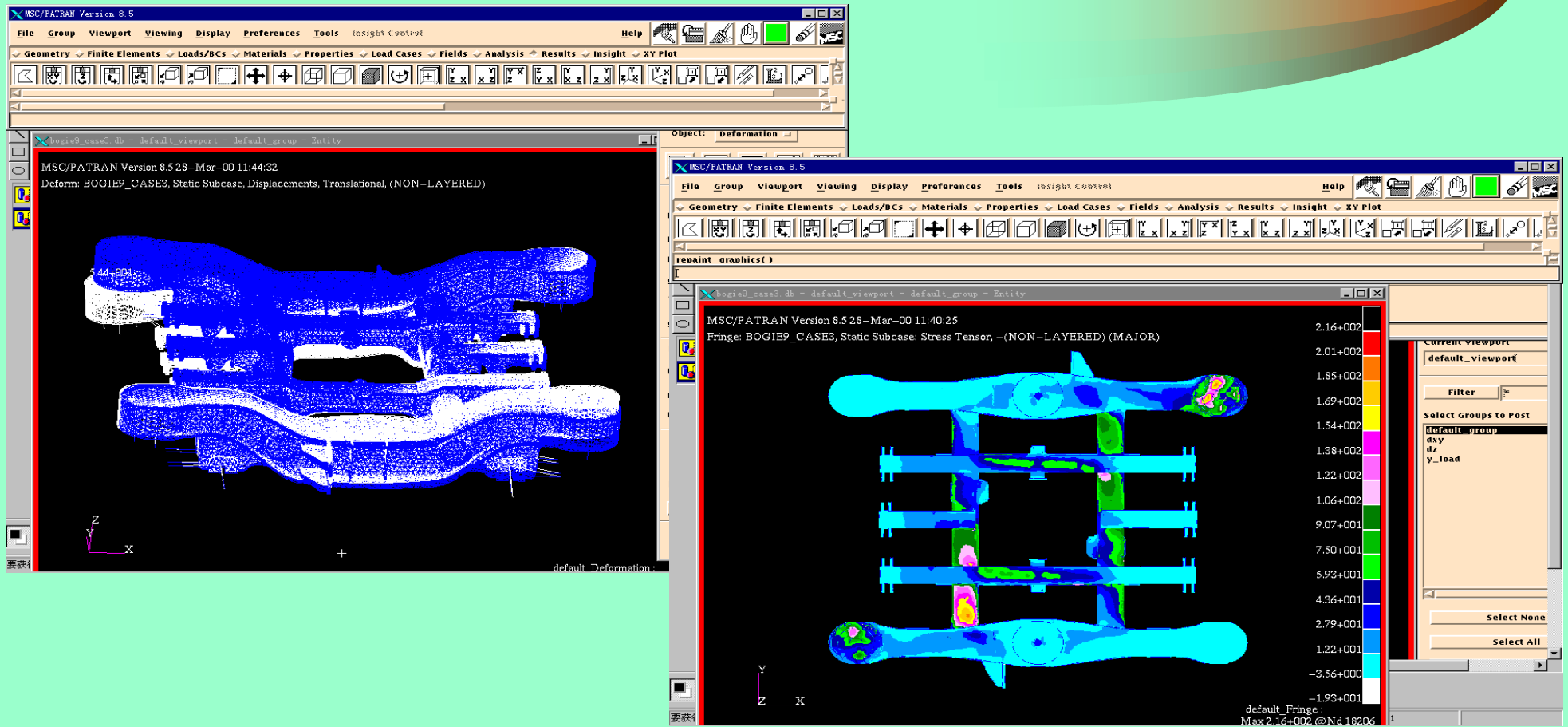


3 □ FEA Model

- Element type : TetMesh
- Boundary condition: Flexible boundary using springs.
- Loads: according to Chinese railway standard
- NASTRAN



Deformation and Stress

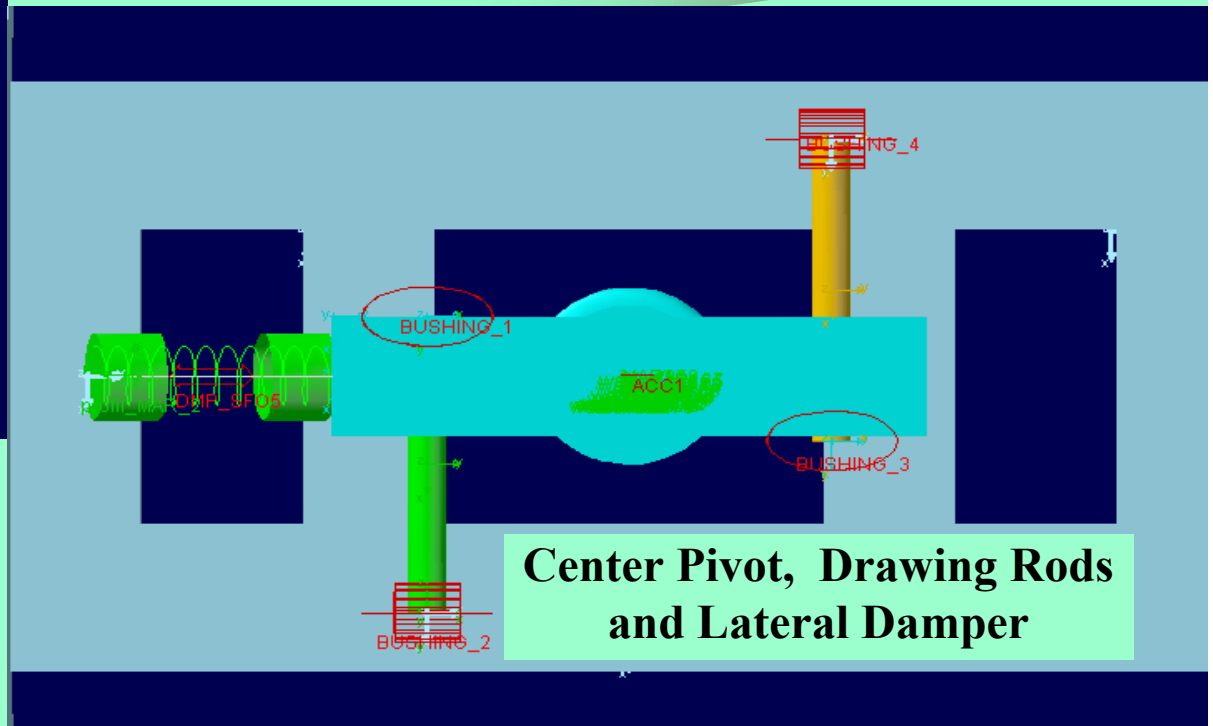
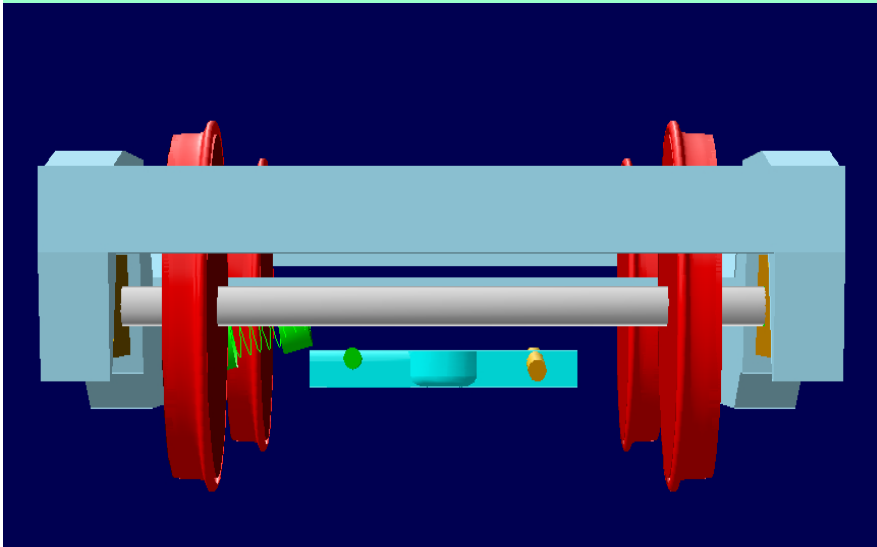


4. Dynamics Simulation

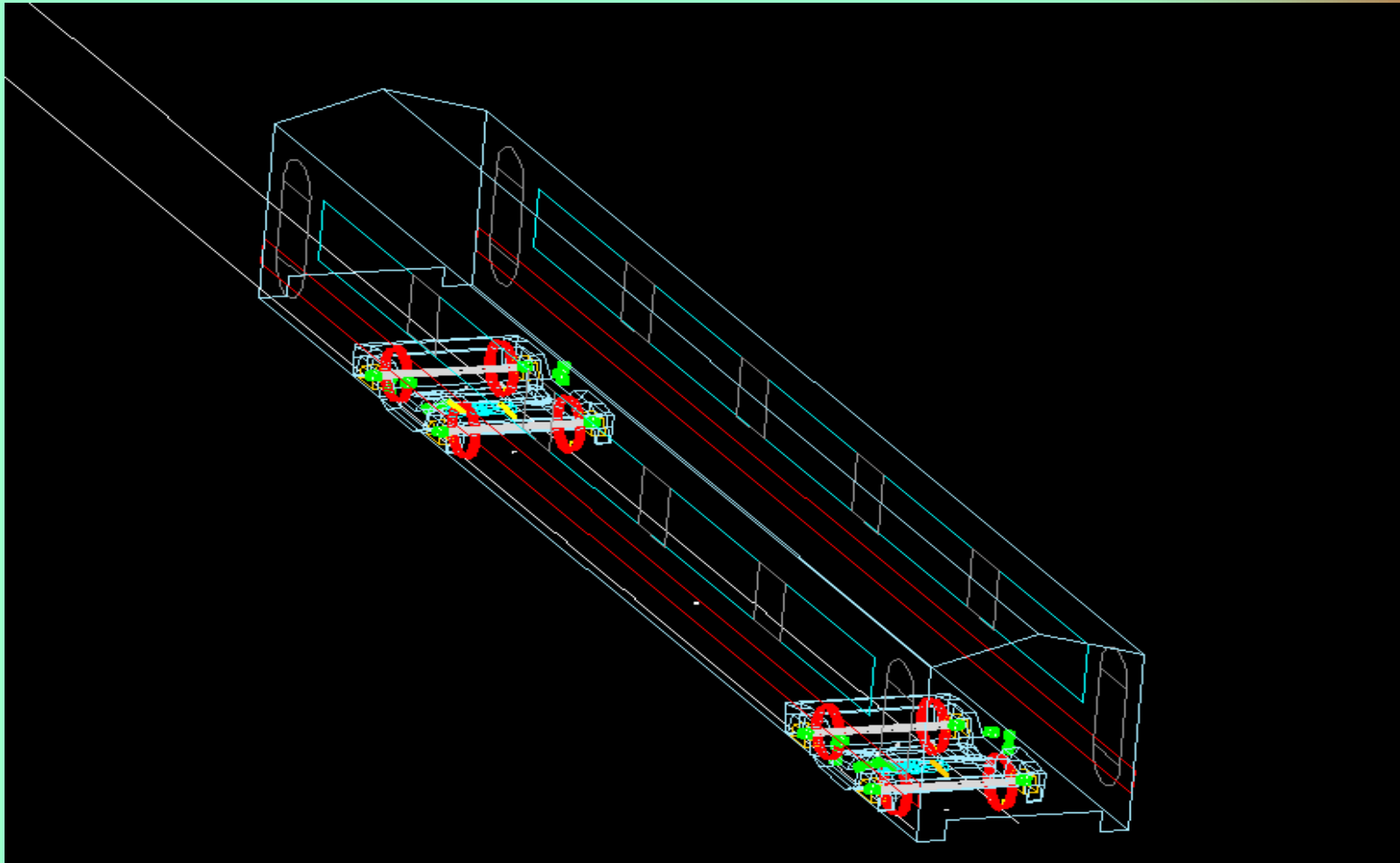


- Track : AAR6 psd data
- Vehicle model : PT200
- Wheel/Rail contact : Level III

4.1 Bogie Model



4.2 Vehicle dynamic simulation system



5. Conclusion and Further works



Conclusion

- Getting a high precision results;
- Short design times;
- Lower cost.

Future works

- Researching on the fatigue and life of vehicle component;
- Optimizing the parameters of this bogie and vehicle;
- Designing complex structure vehicles such as title vehicle, radial truck, independent wheel truck