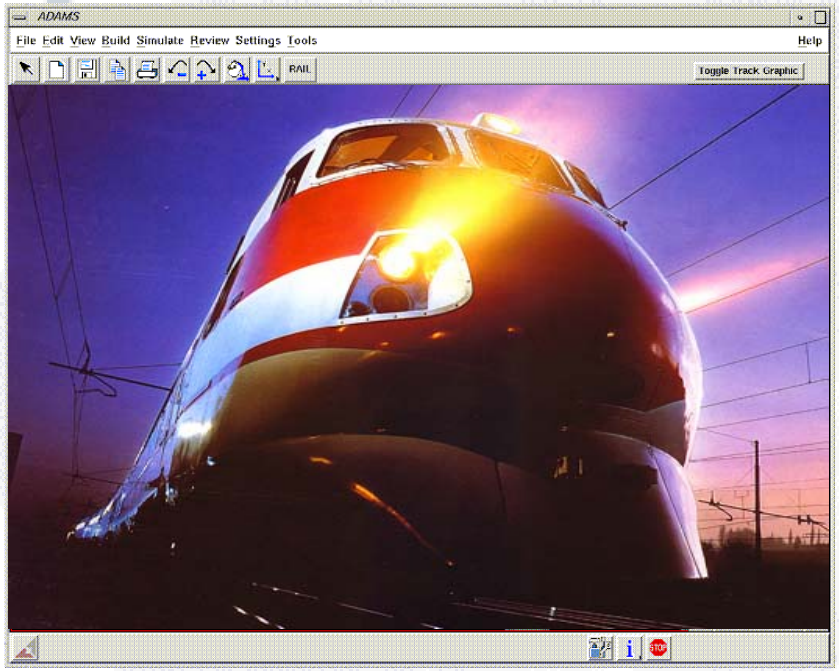
ADAMS/Rail
Users Community and Development Directions



Gabriele Ferrarotti
ADAMS/Rail Product Manager

4th ADAMS/Rail Users Conference
Utrecht, the Netherlands
April 28th, 1999

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Agenda

- The ADAMS/Rail Customers Worldwide
- The new Development Team
- Current and Future Development Highlights

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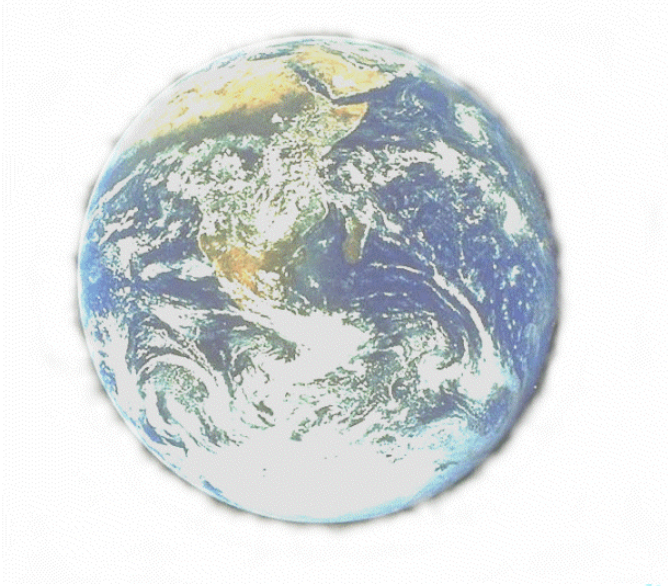
The ADAMS/Rail Customers Worldwide

- 245 Active ADAMS/Rail Seats Worldwide
- 49 Railway Organizations and Research Centers forming the ADAMS/Rail Users Community
- Significant commitments achieved with international companies



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New Customer - ADtranz

ADtranz

- ADtranz group born from previously independent organizations
- Use of different simulation tools and techniques (partly self-developed)
- ADAMS/Rail seen as answer to a need of integration platform software for universal communication
- 15 installations in 8 locations

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New Customer - Loric

„China's Ministry of Rail has selected ADAMS ® as its exclusive virtual prototyping software, leading to a three-year sales and service agreement with China National Railway Locomotive and Rolling Stock Industry Corporation (LORIC) for ADAMS and ADAMS/Rail, Mechanical Dynamics' specialized railcar simulation software."

- Responsible for the design, development, manufacturing, and marketing of rolling stock, locomotives, a.o.
- ADAMS/Rail implemented to develop and test new railcar designs for the rapidly expanding Chinese railway system
- Installations in all LORIC subsidiaries, including Sifang Railway Institute and Works, Zhuzhou Railway Works, and Dalian Railway Institute and Works

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The New ADAMS/Rail Development Team

- Objectives
  - Increment human resources to power up the development process
  - Establish a productive working environment for ADAMS/Rail
  - Advantage of synergy effects through one location
  - Distribute know-how
  - Get local MDI staff focused on customer support
  - Improve reliability of test procedures with
    - Typical railway applications
    - ADAMS specific test examples
  - Provide users with better modeling, solution, postprocessing options

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ADAMS/Rail Development Team´99 - Resources

- In addition to the ADAMS main development staff located in the MDI headquarters:
  - Diego Minen - ADAMS/Rail Development Coordination
    - European Technical Coordinator
    - Experience in Project Managing of MDI products (A/Flex)
  - Giuseppe Manzilli - ADAMS/Rail Core Development
    - MDI Italy Senior Consultant
    - 8 years experience in Fortran and C programming of ADAMS/Solver Subroutines and development of external modules
    - ADAMS/Rail experience acquired through consulting activities in the railway industry

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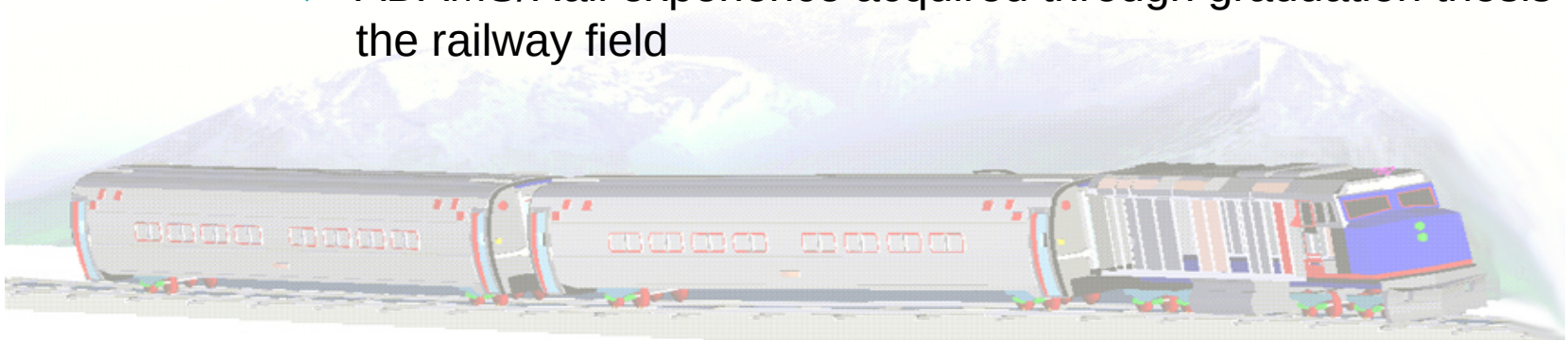
ADAMS/Rail Development Team´99 - Resources

- Guido Bairati - ADAMS/Rail GUI Development Coordination
  - MDI Italy Senior Consultant
  - Experience with ADAMS/View Customization, Template Builder (ADAMS/Car)
- Alessio Lombardi - ADAMS/Rail GUI Development
  - MDI Italy Consultant
  - Experience with ADAMS/View and ADAMS/Car advanced consulting projects
  - ADAMS/Rail experience acquired through graduation thesis in the railway field



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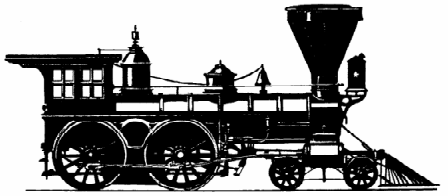
ADAMS/Rail Development Team´99 - Partners

- Partnership with NS Materieel Engineering
  - Technical Specification
  - Validation
  - User Documentation
  - Engineering services

NS Materieel Engineering

- Partnership with ArgeCare
  - Core Development
  - Hotline/support
  - User Documentation
  - Consulting projects



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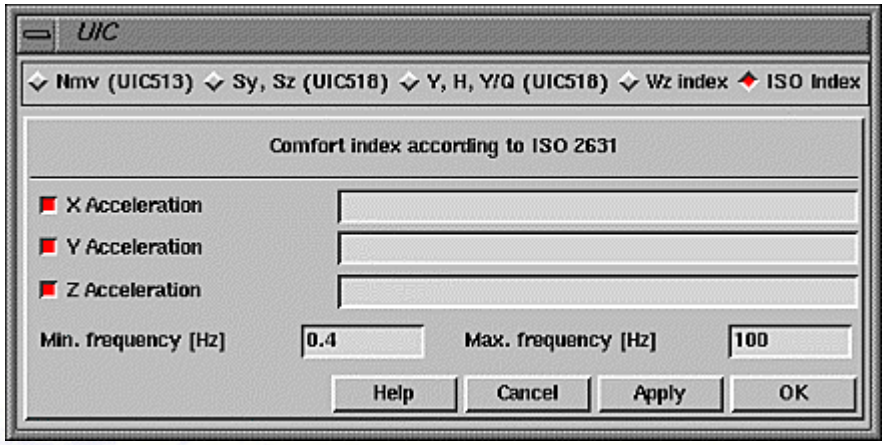
Current Development Highlights

- New Comfort Toolkit
  - Includes the most common comfort indices used in the railway community (UIC standards)
    - ISO2631 Index
    - Wz Sperling - ISO/Sperling
    - Sy - Sz
    - Nmv
    - Y, H, Y/Q
  - Fully specified and validated by NS Materieel Engineering



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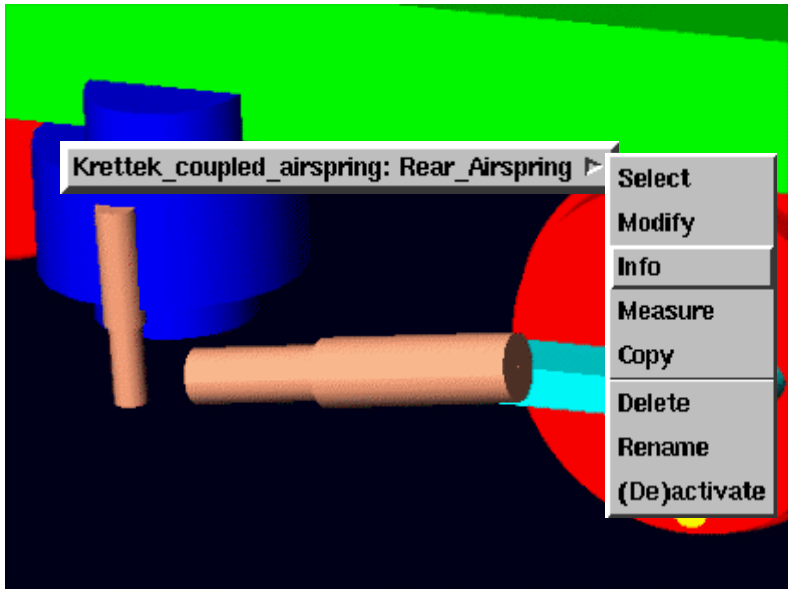
Current Development Highlights

- Railway elements UDE formulation
  - Damper w/ series stiffness
  - Suspension
  - Bumpstop
  - Nishimura Airspring
  - Krettek Airspring
    (single or coupled)
  - ...



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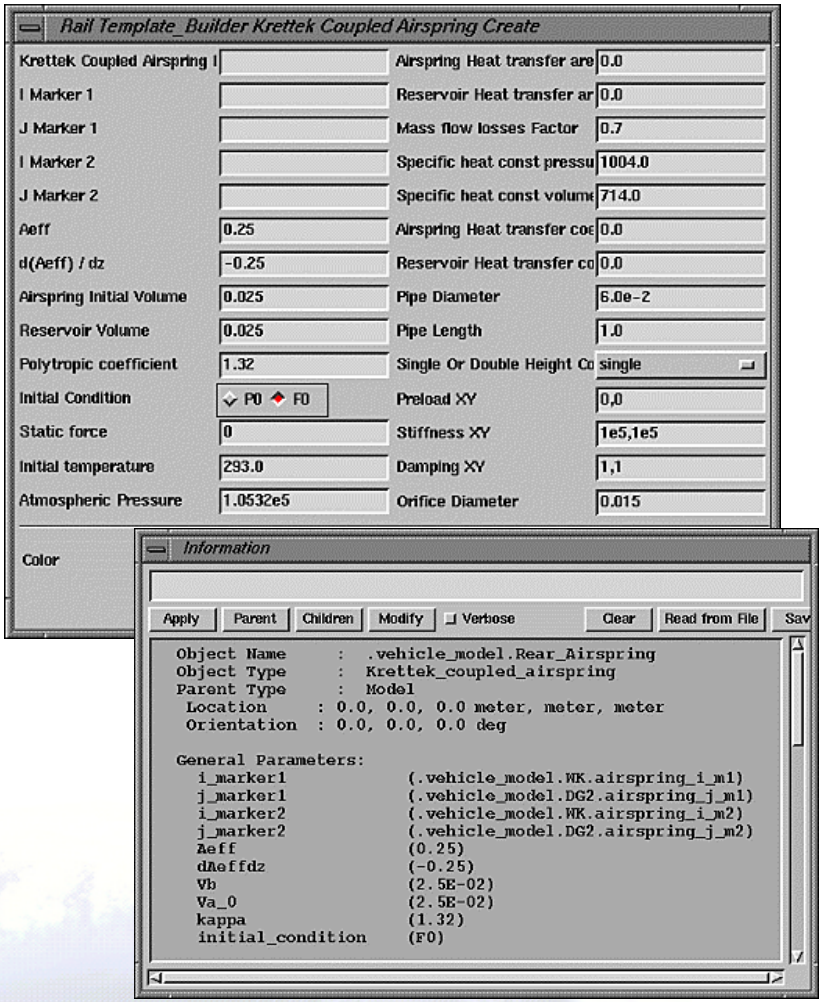
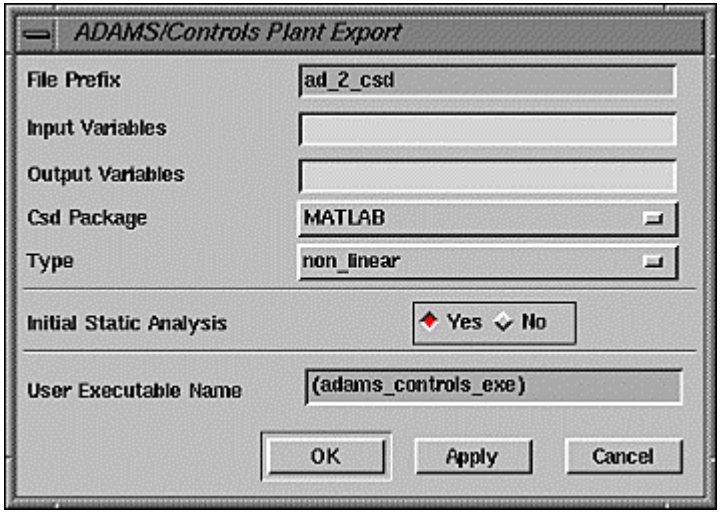
Current Development Highlights

- Example: Krettek airspring
  - Described with non linear thermodynamic equations
  - Takes into account the heat exchange with surroundings
  - Possibility of coupling airsprings
  - Possibility of introducing height control



Current Development Highlights

- ADAMS/Controls Integrated in ADAMS/Rail
  - ADAMS/Controls macros and dialog boxes available from the ADAMS/Rail main graphical interface
  - A/Solver and A/View executable files incorporate the A/Rail and A/Controls routines



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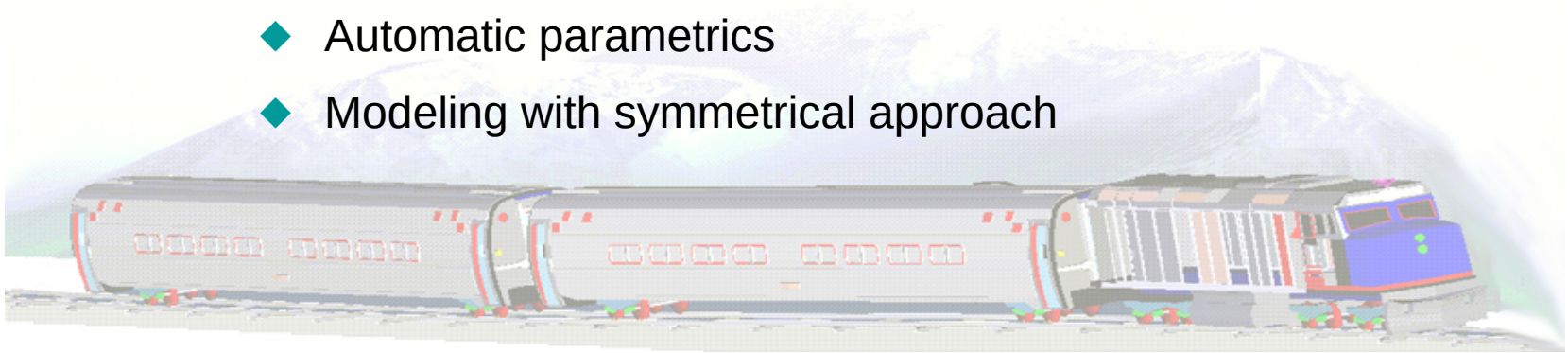
Current Development Highlights

- New ADAMS/Rail Development Environment
- Each component (bogie, car body, ...) build as separated subcomponent
  - Working at system level
  - Automatic library creation
  - Easier model assembly
    - Interactive process
    - Batch process
  - Multiple use of same subcomponent in the full system
  - Efficient subsystem debugging
  - Automatic parametrics
  - Modeling with symmetrical approach



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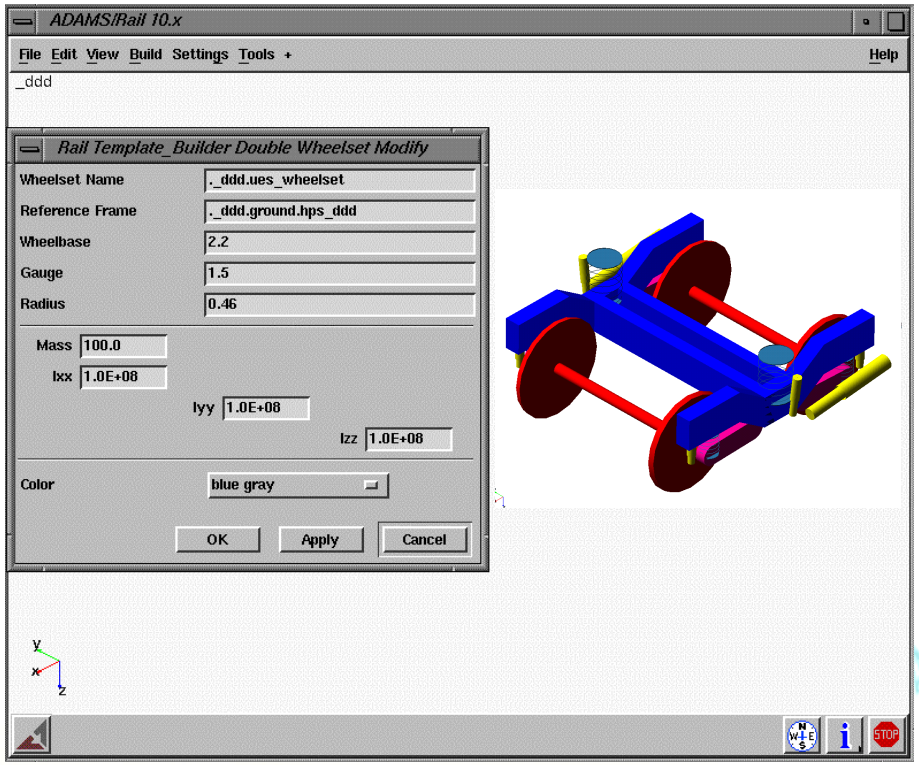
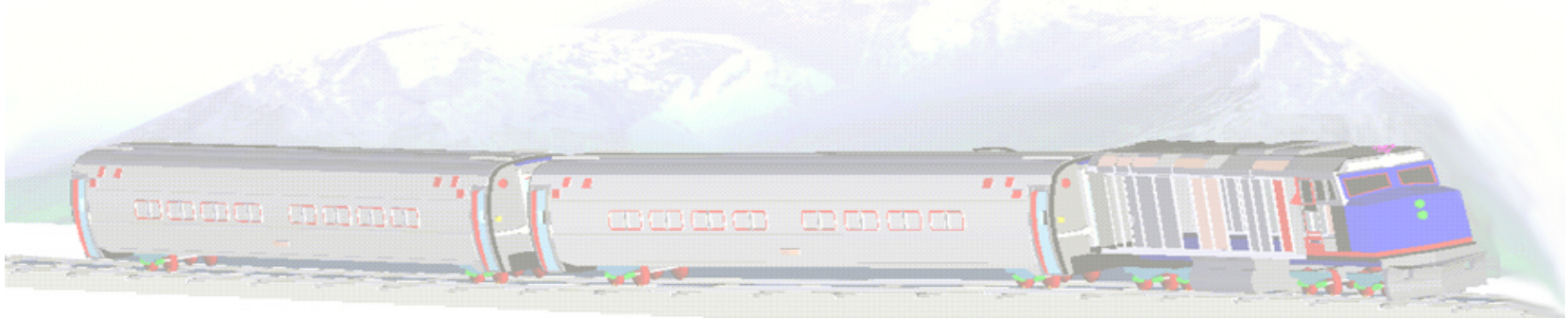
Current Development Highlights

- Separated Model Topology and Model Data
  - Topology described in the template file (fully parametric)
  - Data stored in property files (Teim Orbit format)
  - Database structure allows easy data exchange





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Current Development Highlights

- Two - level Working Environment
  - Expert Interface
    - Subcomponent architecture definition (through Template Builder)
    - Access to all ADAMS modeling entities
    - Possibility of creating test procedures
  - Standard Interface
    - Specifically for design, test, and development engineers
    - Possibility of intervening on parametric contents of the model
    - Use of database libraries to easily create models
    - Simulation environment tailored to working procedures

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ADAMS/Rail - A Partnership for Success!

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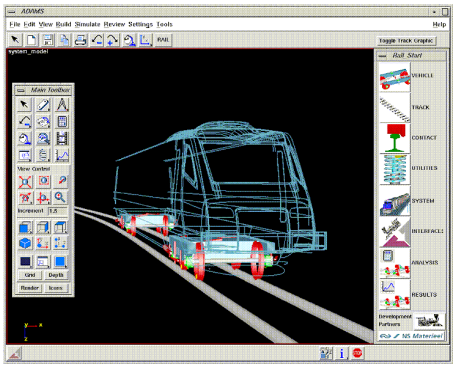

ADAMS/Rail Users Community

NS Materieel Engineering

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