

MECATRAN

RESEARCH GROUP
EXPERIMENTAL
MECHANICS,
CALCULATION
AND TRANSPORT



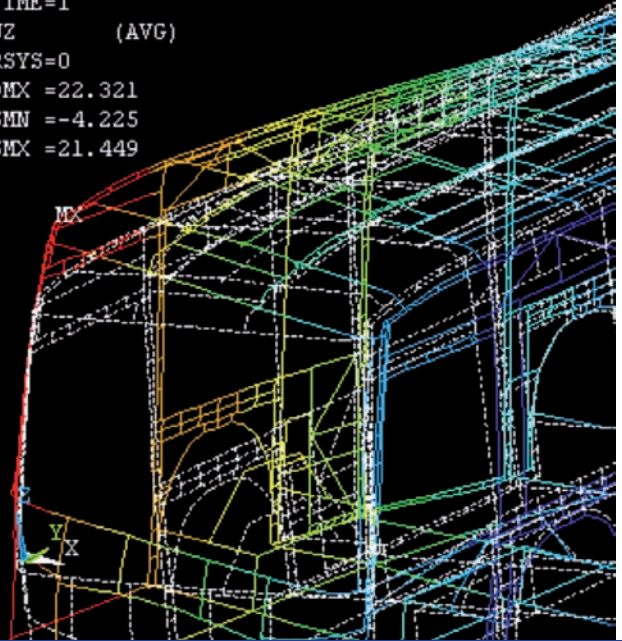
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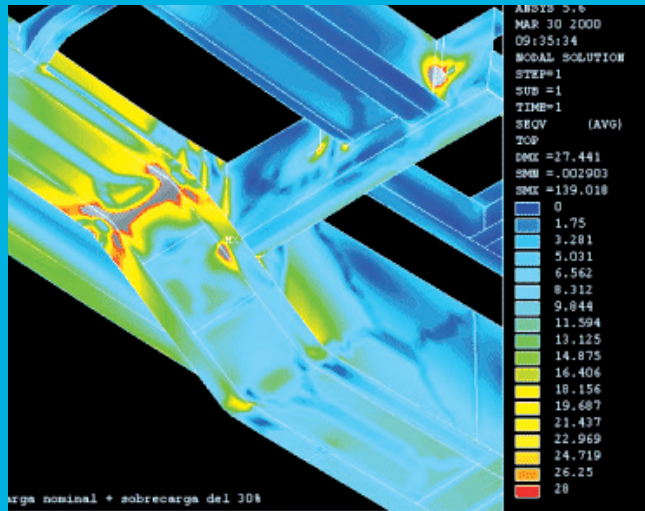
R E S E A R C H G R O U P S

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Detail of stresses in a railway bogie

The MECATRAN Research Group (Experimental Mechanics, Calculation and TRANsport), led by Dr. Vicente Díaz López and Dr. José Luis San Román, is formed by a group of 18 specialists with extensive experience in a broad range of disciplines related to Mechanical Engineering.

• RESEARCH LINES •

- Advanced simulation techniques in Mechanical Engineering
- Machine calculations construction and testing
- Advanced measurement and testing techniques
- Industrial safety and maintenance
- Biomechanics. Railways and automobiles
- Intelligent vehicles
- Transport

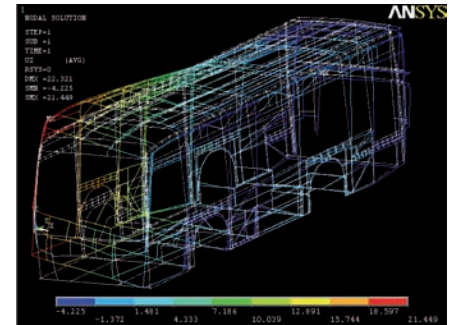


Bevel gear: algor code simulation

- Traffic Engineering
- Accident reconstruction
- Environmental studies, waste recycling and management
- Graphic engineering, simulation and virtual reality
- Acoustics and vibrations
- Applications of artificial intelligence in the field of mechanics, neural networks, fuzzy logic, genetic algorithms, etc.

• OUTSTANDING COLLABORATIONS AND R&D&I PROJECTS •

The MECATRAN group participates actively in the main national and international associations related to Mechanical Engineering such as the Asociación Española de Inge-



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nería Mecánica (Spanish Association of Mechanical Engineering - AEIM), the Sociedad de Ingenieros de Automoción (Society

of Automotive Engineers - SAE) and the Asociación de Profesionales de la Automoción (Association of Automotive Industry Professionals - ASEPA).

The main partners and clients of the group include: A+, AECA ItV, AEIM, Aguas de Barcelona, Ame, Arran Automotion, Atisae, Bosch, Castrosua, Cespa, Cidaut, FCC, Fia, Friomovil, Fundación Fitsa, General de Servicios, Idiada, Insia, Intectra ITV, Inversiones Finisterre, Itevelesa, Jornel Ingeniería, Logitec, Magistral MBA, Metro de Madrid, RACC, RACE, RENFE, SAE, Sernauto, STA, Supervisión y Control, S.A., Tafesa, Tafime, Talvo, TUV Rheiland, Michelin España-Portugal.

Some of the most recent R&D projects of the group are:

- Development of a “hardware in the loop” system of a rollover system for buses (rollhill).
Funding Entity: Community of Madrid-UC3M. Date: 2009

- Development and application of an integrated methodology for studying traffic accidents in which vans are involved.

Funding Entity: Ministry of Development Date: 2008-2011

- Loadable electronic system for measuring the accumulated noise pollution of an automotive vehicle [TRA2008-05654-c03-02].

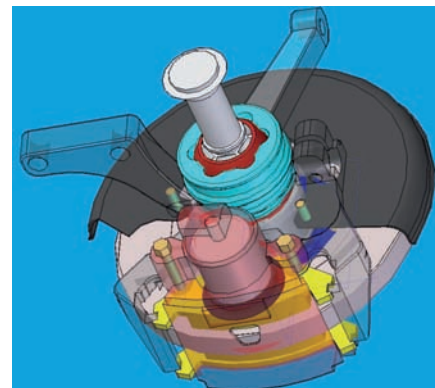
Funding Entity: Ministry of Science and Innovation. Date: 2009-2011

- Design and modeling of an intelligent semi-active suspension system based on magnetorheological shock absorbers.

Funding Entity: Ministry of Science and Innovation. Date: 2009-2011

- Determination of parameters and tests for characterizing noise pollution in automotive vehicles [TRA2007-68080-c03-03].

Funding Entity: Ministry of Education and Science. Date: 2007-2008.



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- Improvement of the safety and comfort of a vehicle by means of designing a semi-active suspension system based on magnetorheological shock absorbers.

Funding Entity: Ministry of Education and Science. Date: 2007-2008

- New process for inspecting the steering system of automotive vehicles in the Ins-



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pección Técnica de Vehículos (Technical Vehicle Inspection - ITV).

Funding Entity: Ministry of Education and Science. Date: 2007

- Analysis of the overturning behavior of a bus by means of an active balancing system (VUELVUS) [CCG06-UC3M/DPI-0688].

Funding Entity: Community of Madrid-UC3M Date: 2007-2008

• SOLUCIONES TECNOLOGICAS INNOVADORAS •

The novel and innovative solutions of the group include:

- Method and system for the preservation and/or transport of fresh products. P20000638.
- Method and system of sterile ventilation and air conditioning. P 9900593
- Movement sensor for a shock absorber. P9901338
- Robust real-time automatic acoustic tele-tachometer with maximum resolution and universal for ignition engines. P9802675
- System for measuring the concentration of pollutants in exhaust fumes of any kind of automobiles in transit. P9802313

• SCIENTIFIC-TECHNICAL SERVICES •

The MECATRAN Group masters the main commercial Software and Hardware tools related to dynamic simulation and virtual reality applied to the technological fields of Mechanical Engineering.

The available applications of the group include:

- Computer Aided Design (CAD) Programs
- Data Acquisition and Processing Programs
- Dynamic Simulation Programs for Mechanical Systems.
- Finite Elements Analysis Programs.
- Experimental Modal Analysis Programs.
- Traffic Simulation Programs.

• TECHNOLOGICAL EQUIPMENT •

The members of the Group form part of the *Instituto para la Seguridad de los Vehículos Automóviles* (Institute for the Safety of Automotive Vehicles - ISVA), which has a laboratory certified by ENAC (LABITV) for the calibration of measuring equipment in ITV.

It also has:

- Push-pull test bench. Maximum force: 200 kN
- Three-dimensional Coordinates Bench.
- Complete ITV line for lightweight vehicles.
- Steering bench.
- Tire bench.
- Advanced data acquisition and analysis systems.
- Advanced extensometric measurement systems.
- Dynamic and Fatigue Test Bench of up to a force of 20 kN of Force, a frequency of 100 Hz and a displacement of 200 mm.
- Magnetorheological shock absorbers.
- KISTLER dynamometric rim.
- Vbox GPS.

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MECATRAN

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