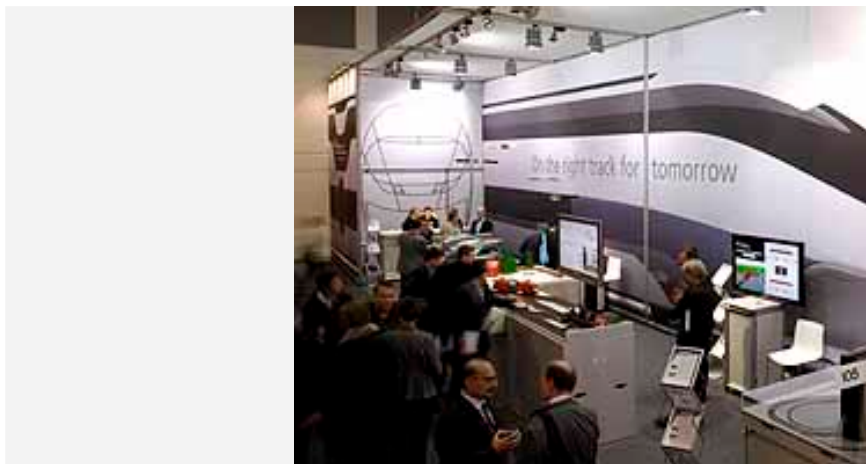

News Archive Transportation 2008

DLR at InnoTrans 2008 - high-tech research for the future of rail transport

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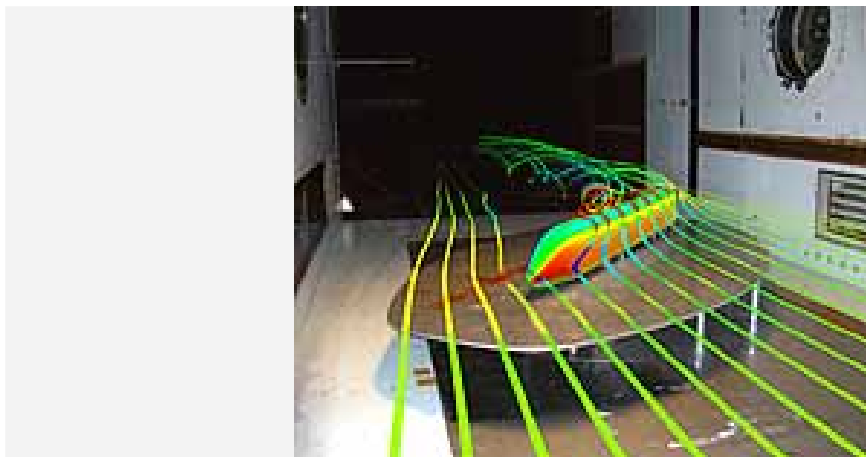


DLR stand at InnoTrans 2008

Fast, energy saving, safe and comfortable: these are the essential qualities for the train of the future. At the same time, the rail system should become more efficient, without compromising safety. At InnoTrans, the world's leading trade fair for rail transport technology, the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) showcased research that can contribute to these goals. The trade fair took place in Berlin from 23 to 26 September 2008.

New developments in research

Basic and applied research on future rail transport technology is an important focus area of transport research conducted at DLR. At InnoTrans 2008, DLR scientists and engineers showcased a wide spectrum of achievements in this field. By highlighting the Next Generation Train project, DLR demonstrated its interdisciplinary competence in rail technology. The Next Generation Railway System project also shows that only a systemic approach to rail traffic management can lead to success. Because all of the research in this field is also aimed at practical applications, DLR cooperates closely with the rail vehicle industry as well as with railway operators.

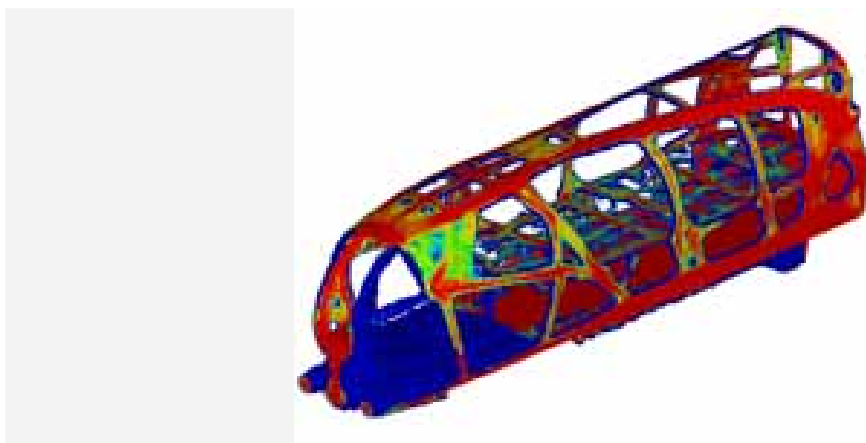


Flow model in the wind tunnel (montage)

Next Generation Train

As mentioned above, the train of the future should be fast, safe, comfortable and economical - but how can these conflicting demands be reconciled? This is the crucial question and also the focus of DLR's rail vehicle research project Next Generation Train. Aerodynamic design plays a key role: drag optimisation, crosswind stability and noise generation in the high-speed range are DLR's top priority research topics in the field. Combined with safe designs for chassis and passenger compartments, as well as minimisation of the wear and tear brought about by wheel/rail contact, this research lays solid groundwork for future train design.

However this in itself is not enough: in order to combine drastic energy savings on the one hand and higher speeds on the other, intelligent energy management and systematic lightweight design are required. For the former, DLR has developed a software tool for full-system modelling. For the latter, DLR's research focuses on multifunctional materials, hybrid structures and carbon fibre-reinforced plastics for surface applications with high bending stiffness. DLR researchers also strive towards cost-efficient production processes for these materials and their integration into flexible, modular vehicle platforms.



Topology (grid structure)

DLR's institutional structure, which combines very diverse but intricately linked areas of expertise, enables it to take an integrated approach to these topics: from initial conception and materials qualification to design, construction and simulation, and ultimately to verification on the basis of product-specific components. This also ensures that one important aspect is taken into account throughout the whole optimisation process: the train passenger.

Next Generation Railway System

In the Next Generation Railway System project, DLR explores another focus area, namely railway operations and the technology behind them. Economical and efficient ways of using the rail network, as well as the technical and operational interoperability of the network, are key factors in the competitiveness of the railway system. DLR develops innovative technologies, methods and concepts for an operational, technological and economical optimisation of the integrated railway system. It

contributes to the definition of standards for the European Train Control System (ECTS) and it helps manufacturers with the certification of new systems and components.



DLR's RailDrive laboratory: view from the cockpit

Regional connections are often expensive due to the cost and maintenance-intensive technology of the railway infrastructure in combination with short headways. By incorporating positioning technology into the vehicle itself rather than into the rail infrastructure, DLR researchers are offering an innovative solution to this problem. In the Railway Collision Avoidance System (RCAS), this approach is applied very consistently. All vehicles located on a given railway section are surveyed to detect potential collisions. This enables the system to give early warnings to the train drivers and, if needed, to apply the brakes. Such a system can, with limited expense, improve safety on railway sections that have not been extensively automated.

Due to the long service life of systems used in rail transport, life cycle costs and optimised maintenance strategies are becoming ever more important. For this reason, research in rail traffic management also focuses on methods to determine and reduce the life cycle costs in order to optimise life cycle management.

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