



Automobile Body, Chassis, Safety, and Structures Activity

This activity contains sessions related to Body Engineering, Fire Safety, Human Factors, Noise and Vibration, Occupant Protection, Steering and Suspension, Tire and Wheel, as well as Vehicle Aerodynamics, Vehicle Dynamics. Each session features critical subject matter experts from industry, R&D as well as academia

SS000 Noise, Vibration, and Harshness (NVH)

This session will cover intake/exhaust/powertrain and chassis noise and vibration. Papers covering vehicle interior comfort, advanced methods and subjective response will also be addressed.

SS100 Body Engineering and Design

BE & D cover several important areas that are related to vehicle body, including its components such as instrument panel, steering column and wheel, seats, hood, decklid, transmission cross-member, hard mounted chassis, CRFM, etc. Topics included are: Novel concepts, Analysis, Design, Testing, Predictions of strength, stiffness, and fatigue life, welding methods, vehicle body quality, durability, reliability, safety, ride & handling, NVH, aerodynamics, mass reduction, as well as fuel economy.

SS101 CAD/CAM/CAE Technology

This session publishes papers and presentations advancing the knowledge in product design, manufacturing processes, and engineering analysis using the state-of-the-art computer technology. The scope includes such areas as CFD, manufacturing and assembly simulation, crash-worthiness, computational mechanics, mold flow, ride simulation, ergonomic design, NVH, reverse engineering, etc. Developments in numerical methods applicable to automotive engineering problems will also be considered.

SS103 Design Optimization - Methods and Applications

This session features papers on new and improved optimization techniques and on application of different optimization methods in component and vehicle design. Methods include deterministic and stochastic optimization techniques. Applications range from noise pressure optimization and vehicle dynamic response optimization to sub-system topology and shape and full vehicle gage and topology optimization.

SS200 Fire Safety

The fire safety session will focus on current developments in the fields of vehicle fire science, statistics, risks, assessment and mitigation. Papers addressing vehicle design, live-fire tests and fire investigation issues applicable to traditional, electric and alternatively fueled vehicles will be presented.

SS300 Automotive Lighting Technology

These papers highlight the interaction of driver vision - which is itself characterized by complexity, flexibility, and high levels of performance—with ever more sophisticated vision technologies to support driver vision. In particular, LED technology continued to advance in the past year, leading to broader lighting applications. Topics covered include lighting design strategy, lighting thermal management, driver fields of view, and characteristics of camera/display systems.

SS301 Human Factors in Driver Vision and Lighting

Visual perception continues to be a critical aspect of overall driver performance. This session offers presentations highlighting new developments designed to provide better support for driver rearward vision, better understanding of how to measure light and its effects on drivers' eyes, and better understanding of how drivers accomplish the visually difficult task of negotiating intersections.

SS302 Human Factors in Driving and Automotive Telematics

As information and entertainment to and from the vehicle (Telematics) become more prolific it is critical to increase our understanding of how the driver understands and uses Telematics functions. Equally critical is how those functions impact the driver. This session will address those issues.

SS303 Human Factors in Seating Comfort

Designing vehicles with good ergonomics is one of the many factors needed to achieve high customer satisfaction. A basic source for comfort (or discomfort) lies in the vehicle's seats. To design for seat comfort requires knowledge of the size of the driver, the structure of the seat, the position of the seat in the vehicle and the trip duration. Papers offers in this session could include topics such as seat back angle, vehicle packaging and trip duration.

SS304 Mobility Issues for an Aging Population

Presentations will cover how this group will have unique issues associated with it that will need to be addressed by the automotive industry as they design vehicles for this ever-growing population."

SS400 Active Safety: Systems and Sub Systems

This session will focus on how Active Safety and Driver assistance systems are gaining importance and yielded significant safety benefits that are possible from the deployment of those systems in the fleet. It will address deployment strategies and technologies used by the industry and the government as well as consumer acceptance and market demand for these systems. Lastly, discussion on information gained from the various onboard sensors and vision systems in active safety systems will occur.

SS500 Occupant Protection: Accident Reconstruction

This session focuses on the latest research related to methods and techniques for reconstructing vehicular crashes involving wheeled and tracked vehicles, pedestrians, and roadside features. Emphasis is placed on experimental data and theoretical methods that will enable reconstructionists to identify, interpret and analyze physical evidence from vehicular crashes.

SS501 Occupant Protection: Biomechanics

The Biomechanics session presents new research on automotive occupant kinematics, human injury biomechanics, and human tolerance in an automotive environment. This includes new methodologies in the study of human injury, studies of human interaction with occupant protection systems, technological advances in physical and virtual anthropomorphic test devices, and other experimental, analytical and modeling studies on the biomechanics of human injury.

SS502 Occupant Protection: Event Data Recorders (EDR)

This session includes the latest research on Event Data Recorders (EDRs) equipped in passenger cars, light trucks, and commercial vehicles (heavy trucks and motorcoaches). Emphasis is placed on the application, interpretation and use of EDRs in the investigation of motor vehicle crashes.

SS503 Occupant Protection: Integrated Safety Systems

Topics to cover those potentially enhancing occupant safety protection, such as sensors, algorithms, sensor system fusion, hardware, new or reinvented restraint devices and vehicle structural modification, etc. as resulted from deployment of integrated safety systems.

SS504 Occupant Protection: Occupant Restraints (Air Bags, Seat Belts, Knee Bolsters, Child Seats, etc.)

The Occupant Restraints Session invites papers that document new research on the restraint topics of airbags, seat belts, inflatable bolsters/seat belts, knee bolsters, Child Restraint Systems (CRS) and other related areas. These papers could include several of the following: technology description, occupant performance considerations, field data studies, development/validation methodology / results, CAE/Finite Element methods/results, packaging, and implementation / performance challenges.

SS505 Occupant Protection: Pedestrian and Cyclist Safety

The pedestrian and cyclist safety session focuses on research and development efforts aimed at protecting pedestrians and cyclists in the event of vehicle impact. Papers on injury biomechanics, vehicle design, dummy and impactor development, computational modeling, regulations and consumer assessment testing, active safety and collision avoidance are accepted for this session.

SS506 Occupant Protection: Rear Impact, Side Impact and Rollover

This session will have presentations that address advancing the science of occupant safety in vehicle rear impact, side impact, and rollover collisions.

SS508 Occupant Protection: Safety Test and Simulation Methods and Applications

This session calls for papers pertaining to advances of safety-related state-of-the-art experimental and computer modeling methods towards (1) occupant protection in frontal/side/rear/rollover impact modes and weight reductions, and (2) autonomous vehicles. The scope includes full vehicle, sub-system, and component levels in testing and numerical modeling studies on new vehicle products and occupant counter-measures development. Topics dealing with designs of new safety concepts, applications of advanced CAE and optimization techniques, characterization and utilization of light-weight materials, and active safety test methodologies (i.e., AEB, pedestrian protection, etc.) will also be considered.

SS510 Occupant Protection: Structural Crashworthiness and Occupant Safety

Presentations will cover critical issues in advancing the science of occupant safety in vehicle collisions.

SS599 Technical Expert Panel Discussion: What do autonomous vehicles mean for regulation?

Automated Driving Systems present many potential benefits to society but might encounter obstacles within current US regulation and infrastructure. As vehicle designs progress toward full automation, passenger compartment configurations are expected to deviate from traditional seating arrangements. These new configurations, as well as other changes to vehicle structures, will pose challenges for manufacturers to assess occupant protection using novel restraints and to certify their vehicles under the current Federal Motor Vehicle Safety Standards (FMVSS).

SS600 Steering and Suspension Technology Symposium: Suspension Topics

The purpose of this session is to provide a forum for presentations on suspension related topics as it applies to ground vehicles. Papers for this session should address new approaches as well as advances in application of suspension and related technologies.

SS600 Steering and Suspension Technology Symposium: Steering Topics

The purpose of this session is to provide a forum for presentations on steering related topics as it applies to ground vehicles. Papers for this session should address new approaches as well as advances in application of steering and related technologies.

SS700 Tire and Wheel Technology

This symposium aims to provide a forum to bring together researchers do discuss and disseminate the research on tire and wheel technology. Examples of topics to this symposium include (but are not limited to) nonlinear behavior of tires and wheels, static/dynamic stress analysis, nonlinear material modeling, contact stress, impact, noise, vibration, traction, hydroplaning, effect of tires on vehicle performance, rolling resistance, and durability.

SS800 Vehicle Aerodynamics: Fundamental Aerodynamics

Topics to be addressed include: test facilities, unsteady aerodynamics, fuel economy, cooling airflow, fundamental aerodynamics and aerodynamics development.

SS800 Vehicle Aerodynamics: CFD Methods Development

Computational Fluid Dynamics has become a lead design tool for vehicle development. This session explores the development of new algorithms, the novel application of existing approaches and the limitations of current processes.

SS800 Vehicle Aerodynamics: Aerodynamics Development

Topics relevant to the aerodynamics development of automotive products are discussed in this session. This includes concept and production car development along with proposals for applying new development approaches.

SS800 Vehicle Aerodynamics: Commercial Vehicles

Drag reduction is key to the economic operation of commercial vehicles. this session explores new approaches to drag reduction, new test facilities and simulation approaches specifically aimed at this class of road vehicle.

SS800 Vehicle Aerodynamics: Experimental Technologies & Correlation

Topics to be addressed include: test facilities, unsteady aerodynamics, fuel economy, cooling airflow, fundamental aerodynamics and aerodynamics development.

SS800 Vehicle Aerodynamics: Rotating Flows

Topics to be addressed include: test facilities, unsteady aerodynamics, fuel economy, cooling airflow, fundamental aerodynamics and aerodynamics development.

SS800 Vehicle Aerodynamics: Unsteady Aerodynamics & Aeroacoustics

Topics to be addressed include: test facilities, unsteady aerodynamics, fuel economy, cooling airflow, fundamental aerodynamics and aerodynamics development.

SS800 Vehicle Aerodynamics: Surface Contamination

Topics to be addressed include: test facilities, unsteady aerodynamics, fuel economy, cooling airflow, fundamental aerodynamics and aerodynamics development.

SS900 Vehicle Dynamics, Stability and Control

This session is focused on vehicle dynamics and controls using modeling and simulation, and experimental analysis of passenger cars, heavy trucks, and wheeled military vehicles. This session addresses active and passive safety systems to mitigate rollover, yaw instability and braking issues; driving simulators and hardware-in-the-loop systems; suspension kinematics and compliance, steering dynamics, advanced active suspension technologies; and tire force and moment mechanics.

SS901 Electric Vehicle Drivetrain Dynamics

This session deals with the analytical and experimental studies of vehicle electric drive vehicles or any non-conventional vehicle concepts that stretch the vehicle dynamics/mobility performance using intelligent technologies such as in-wheel motors, torque-vectoring controls, multi-wheel steer-by-wire, etc.