



INTERNATIONALES SYMPOSIUM
FÜR ENTWICKLUNGSMETHODIK



11th International Symposium on Development Methodology

“Challenge of Global Competition – Sustainable, Intelligent and Faster?!”

A joint event of AVL and Prof. Dr. Christian Beidl, Technical University Darmstadt

Dear Sir or Madam,

On **November 11 and 12, 2025**, the **11th International Symposium on Development Methodology** in vehicle and powertrain development will take place in Wiesbaden. The event is organized by AVL Deutschland GmbH together with the Institute of Internal Combustion Engines and Vehicle Drivetrains at the Technical University of Darmstadt.

The motto of this year's event is **development methodology in regard to the “Challenge of Global Competition – Sustainable, Intelligent and Faster?!”**, because the automotive industry is at a crucial turning point: global competition is increasing, challenging companies worldwide to act not only efficiently, but also sustainably and with an eye to the future. How can we succeed in a market that demands constant change? What strategies are needed to combine new technologies, sustainability and speed? We want to work with you to develop solutions that meet the demands of global competition while taking responsibility for the environment and society.

In addition to the use of methods in the development and validation of electrified and non-electrified propulsion systems, the connected vehicle, and ADAS/AD functionalities, we are giving a special podium to the topics of digitalization, virtualization, and simulation as well as the software-defined vehicle. Furthermore, methodologies from the practice of vehicle and powertrain development will be in the foreground. Contributing to this will be best practices from system development, testing, calibration, modeling, and optimization.

We kindly ask you for presentation proposals on the topics listed in the appendix.

We would be pleased to receive an **abstract** from you with a maximum of 3,000 characters, stating title, author, co-authors, and company address including contact details. Please send it by **February 21, 2025, at the latest** to:

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Kind regards,
Your Program Advisory Board

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In general contributions should address the following topics in the context of development methodology:

- Vehicle and powertrain technology
- Development and testing approaches – simulation – calibration – testing
- Methods, tools, processes, people, organization
- Challenges of the future? Possible solutions?
- Management and leadership in times of change

Typical questions addressed in the symposium:

- We are in times of change with increasing diversity. Transformation is on its way including many uncertainties! Where is the technology driving to? How to deal with this in terms of development and methodology approaches?
- How can we apply methods to decide on the right concepts?
- How do I and my organization prepare for the upcoming trends?
- Where do regulations help? What impact do they have on the methodology? How does methodology help to master them? What does it mean for competition?
- What are the future mobility concepts and their implications on our work?
- Where are we in terms of sustainability and how do methodology-based approaches look like?
- How do newcomers and experienced OEM's in the powertrain and vehicle market deal with innovative approaches?
- Which existing or new methods and tools can be applied to which technologies?
- How can AI help? How do application examples look like?
- How can the existing invest still be used to the full?
- How can OEM's together with new start-ups collaborate in development processes? How to get an overall view on requirements of vehicle development in this collaboration?
- How to deal with the different technology topics in terms of development approaches? What is right, what is not?
- What are enablers in development? What hinders us, e.g. time wasted with unproductive documentation, database care or validation? How do concepts look like to approach these topics in a method-based way e.g. using AI.
- What is the value and core competence in the development of the actual new technologies?
- How to transition from conventional to future proof approaches in development and testing? How to take existing engineers with you on this road?

Specific content examples for possible contributions:

1.) New technologies – new methods:

- New Energy Vehicles (Fuel Cell/BEV)/Zero Impact Emission
 - Battery development including safe-guarding and product safety topics
 - E-machines PSM/ASM/EESM
 - Power electronics (SI/SIC/GAN)
 - Energy flow/Energy source/Infrastructure/Lifecycle assessment
 - Lubrication/Cooling

- Thermal management/Conditioning (heating/cooling)
- Combustion engine next generation (hybrid)
 - Alternative fuels/fuel detection
 - Combination of synthetic fuels and hybridization
 - Battery for different levels of hybridization (400V/800V/1000V vs. 48V/60V)
 - Hydrogen – challenges, usage and application in the context of development and validation
- Vehicle integration – system optimization, e.g. optimization of operating strategies
- AD/ADAS
 - Vehicle integration
 - Interaction powertrain
 - Safeguarding, validation and homologation
 - Scenario-based testing
 - In-vehicle testing versus testbed versus simulation
 - Acceptance and “perceived safety”
 - Electronics and software integration
- In-Use-/Onboard-Monitoring
- New E/E architectures and “software-defined vehicle” in the context of powertrains
 - Central ECU architectures and operating systems
 - What are the implications for methodology?
- Development process – data and knowledge
 - Vehicle fleet as a data collector
 - Chances/risks
 - Fleet data as part of the development
- Mobility systems/geofencing
- System borderlines – how do these change, e.g., from vehicle to charging infrastructure? What are the impacts on our daily work and according methods?
- System engineering – from specification to test case
- Cyber security – challenges and solutions
- New challenges from regularities: UNECE, RXSWIN, SUMS, ASPICE
- Connectivity, e.g., connected powertrain and driver assistance

2.) New methods – ideas, proof of concept and integration:

- Significance/Application of AI in methodology
 - AI and its application in powertrain and vehicle development
 - AI between the worlds – curse or blessing

- What does AI bring in the future? What are people working on?
 - AI – applications and how we deal with regulations in different parts of the world
 - Application examples
 - AI-based validation/How do we validate AI-based results?
 - Robust, transparent solutions?
 - AI and ethics
- PLM/Big Data/Data Analytics: Continuity in the use of data, results, and models
 - Digital Twin/Virtual Twin
 - Virtualization/Simulation
 - Standalone simulation
 - Highly integrated/connected simulation – e.g., simulation in testing
 - Co-simulation
 - Into the Cloud
 - Frontloading/Road2Rig
 - Which methods and tools can be applied to which technologies? Considering:
 - Next generation powertrains
 - Increase in diversity
 - Uncertainty on which technologies will define the future
 - Use of existing investments
 - Validation – risk management gets a new importance
 - What can be achieved in the context of simulation? Where do we need real testing?
 - Are component testbeds increasing in importance?
 - System integration testbed/modular testbed (SiL, MiL, HiL)
 - Release processes – Over the air update in contradiction to homologation
 - Challenges
 - Methodological approaches
 - What do we gain with methodology? Examples for cost savings, reasoning for invest, ROCE

3.) **Future-proof processes:**

- Meta level of methods – method management in the company
- Systems engineering
- Software- (or function)-defined vehicle – frontend development of function development
- V-model – transition to DevOps cycle / Cross-generation development / Test-driven development
- Development and testing processes
- Connected development
- “Agile development”

- “Data management”
- Smart processes in development
- Examples for successful introduction and usage of new methods
- Increase of efficiency through application of new methods
- Companies undergoing “methodical” change – opportunities and risks

4.) **Sustainability:**

- Which methodical approaches do exist in the context of sustainability?
- How is sustainability integrated into product strategies?
- Sustainability as a valuable part of the product. Do we need different concepts in development in different parts of the world?
- R-strategies – Refurbish/Remanufacture
- How do we get a reliable LCA?
- Examples for EU7/non-exhaust emissions (brake, tire?)
- Zero impact validation / green V&V

5.) **“Man as developer” – people in the context of engineering work – new challenges, new methods:**

- How has working changed?
- Changing roles and requirements
- Cooperation under changed conditions
- How does the transformation in development and the increasing diversity influence existing organizations? How to deal with them?
- How to take people with you in this transformation?
- Challenges for future engineers and universities in terms of job profiles

6.) **“Man as customer”**

- How will future vehicle concepts take people and individual needs into account?