*Programme may be subject to change

Final programme

Wednesday: May 21, 2025

8.30 (CST)	Welcome
9.00	**Keynote**: Chris Hopper Managing Director, Realis Simulation Inc. **Winning the world market: the case for continued ICE and hybrid development**
	Chair: Michal Brezina Product Manager, Structural Mechanics products, Realis Simulation
9.30 (CST)	**Oil consumption analysis and investigation based on RINGPAK** Zeng Qingxing Weichai Power
10.00	**Research and development of low-carbon/zero-carbon engine pistons, and dynamics simulation** Shi Xiaming ShanDong BinZhou Bohai Piston Ltd
10.30	Tea break
	Chair: Evgeniy Shapiro Senior Product Manager, Fluid Dynamics, Realis Simulation
11.00 (CST)	**Engine ECU Hardware-in-the-Loop simulation and testing based on WAVE-RT** Hongwei Lei BYD Co. Ltd.
11.30	**Digital Twin boosts vehicle exports overseas** Xueming Wang Ricardo Shanghai
12.00	**WAVE-RT - Real-time capabilities in 1D simulation** Luping Bi, Business Unit Director, Powertrain - Base Development FEV China Co., Ltd
12.30	Lunch

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	Chair: Michal Brezina Product Manager, Structural Mechanics products, Realis Simulation
13.30 (CST)	**Key technologies for friction optimization and energy efficiency improvement of the internal combustion engine** Xu Xianfa Weichai Power
14.00	**Friction power distribution analysis of a gasoline engine using FAST and benchmarking** Ouyang Xianlin Jiangling Engine Co. Ltd.
14.30	**Application of FAST in the development of high-performance and high thermal Internal Combustion Engines** Lang Xiaojiao Great Wall Motor Co. Ltd.
15.00	**Thoughts on the Development of High Load Lightweight Pistons with Advanced Materials and preparation processing** Dahui Chen Ningbo Piston
15.30	Tea break

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	Chair: Vratislav Ondrak Product Manager, Systems Engineering, Realis Simulation
16.00 (CST)	**Application of VALDYN and PISDYN in the development of Dachangjiang Motorcycle Engines** Zhenbang Huang Jiangmen Dachangjiang Group Co. Ltd
16.30	**Application of VULCAN in the thermal boundary calculation of Loncin high-performance motorcycle engines** Jiashun Li Loncin Motor Co. Ltd
17.00	**Application of IGNITE and WAVE in the development of Dachangjiang Motorcycles** Hongliang Gao Jiangmen Dachangjiang Group Co. Ltd
17.30	**Dynamic simulation of a gear train for a hybrid transmission** Bifeng Yin Jiangsu University
18.00	Close

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Thursday: May 22, 2025

Realis experts will host a series of workshops demonstrating how Realis Simulation products deliver low carbon solutions and reduce time to market. The workshops are organised by solution domain running concurrently in 2 separate rooms.

	Workshops Fluid Dynamics and Systems Engineering Room 1
9.00 (CST)	**Acoustic optimisation using WAVE and ModeFRONTIER** Automation offers a great potential for improving efficiency in CAE and design workflows. Utilising the power of advanced optimisation algorithms to determine geometrical parameters which deliver best possible performance for the components such as mufflers and silencers can save engineering teams' time. It can also deliver designs more optimised than what would be possible with manual approach or design of experiment type of studies. WAVE and modeFRONTIER offer the best possible combination to increase efficiency hope acoustic design through large scale simulations. In this workshop you will learn how to prepare the WAVE model for optimisation, operate the WAVE custom node in modeFRONTIER and set-up and run an optimisation using an example of a motorcycle muffler. Evgeniy Shapiro, Qingquiang Jiang, Danilo Di Stefano (ESTECO)
10.30	Tea break
11.00	**Model Based Development (MBD) approach to motorcycle hybrid and electric powertrains using IGNITE** Learn how to apply Model-Based Development (MBD) methodology for designing and optimising hybrid motorcycle powertrains using IGNITE. This workshop uses physics-based models to define, evaluate and optimise drivelines for performance and fuel economy legislative requirements. Attendees will explore co-simulation techniques, integrating multi-domain models for vehicle controller development and calibration using this model-in-the-loop environment. You will also learn how to take advantage of higher-fidelity models, using software such as Realis SABR for more accurate transmission efficiency predictions. This workshop will be of interest to all those involved in the design and development of hybrid and electric motorcycle architectures. Vratislav Ondrak, Shuxin Jiang
12.30	Lunch

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13.30	**Clean combustion modelling with VECTIS 3D-CFD** VECTIS offers a full suite of frameworks to model combustion and engine-out emissions. In this workshop, you will learn how to combine these frameworks in an accurate and efficient workflow to accurately assess the various impact of fuel composition (ethanol dilution, aromatic content, etc.) on a powertrain combustion and emissions. Attendees will be presented with an overview of the various stages of the process from chemistry pre-processing, meshing, and set-up of physical models for spray and combustion. Sample results will illustrate how this workflow enables iterative design improvements for both fuel formulation and powerplant performance. This workshop is ideal for engineers and researchers working in combustion modelling, emissions analysis, and powertrain development. Whether you're focused on optimising low-carbon fuel blends or refining an engine design to meet stringent emissions targets, this workshop will demonstrate how VECTIS can help you. Qingquiang Jiang, Evgeniy Shapiro
15.00	Tea break
15.30	**WAVE-RT as part of the virtual calibration process** Accurate performance of an Internal Combustion Engine (ICE) digital twin is essential for design, optimisation, calibration and diagnostics of engine plant performance and emissions output. Ricardo R-Desk Tuner provides a fast and accurate method of calibrating faster-than-real-time plant models. In this workshop you will learn about the features of surrogate optimisation and its application to model calibration and learn how to set-up an optimisation task to calibrate a real-time model to desired performance parameters. We will also introduce advanced subjects such as predictive combustion and turbulence modelling calibration. Evgeniy Shapiro, Qingquiang Jiang
17.00	Close

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	Workshops Structural Mechanics Room 2
9.00 (CST)	**Minimising Lubricant Oil Consumption (LOC) using RINGPAK** Learn how to use RINGPAK to find the optimal trade-off between oil consumption, blow-by and friction. This workshop will cover how to run and perform a sensitivity study of various parameters of a ring pack design and how to use Transient RINGPAK to investigate the increased oil consumption during a change of engine load and speed. This workshop will be of interest to all those involved in ring pack and piston design and those concerned with combustion engine efficiency, oil consumption and emissions. Michal Brezina, Zhiguo Lu
10.30	Tea break
11.00	**ICE power cylinder thermal analysis** Learn how to use the Realis FE-based thermal analysis tool FEARCE-Vulcan to quickly and accurately predict the temperatures of all the components of the power cylinder using physical and semi-empirical correlations. This workshop will be of interest to all those involved in the design and development of the Internal Combustion Engine (ICE). You will learn how to a set-up thermal engine simulation that considers all the heat-paths within the power cylinder. The workshop will also demonstrate how the tool can be used with VECTIS 3D CFD using co-simulation, for integrated exhaust manifold cylinder head designs and for coupling coolant flow. Zhiguo Lu, Michal Brezina
12.30	Lunch

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13.30	**Minimising friction using the Realis toolset** Learn how the Realis Structural Mechanics toolset can be used to evaluate and minimize engine friction. This workshop will cover how the toolset can be used to investigate the trade-offs between NVH, durability and friction, and how FAST is used for predictive friction assessment in the early stages of an engine design programme. You will learn how ENGDYN can be used to predict bearing power losses against engine speed and oil feed temperature, and how these data can be used in IGNITE to predict fuel consumption for a P2 hybrid driveline. The impact on fuel consumption of changing the main bearing diameter from 45 to 40 mm will be demonstrated. This workshop will be of interest to all those involved in delivering efficient Internal Combustion (IC) engines. Michal Brezina, Vratislav Ondrak, Zhiguo Lu
15.00	Tea break
15.30	**Delivering transmissions for the future** Learn how to use SABR and SABR-Gear to quickly design concept EV transmissions. This workshop will cover how to perform parametric studies to target multi-filtered aspects of gear design for durability, efficiency, scuffing performance and NVH using multi-core processing to reduce the solution time to minutes. NVH studies of the dynamic response of transmissions to whine and motor excitation is covered using SABR's link to VALDYN. Perturbation analysis highlights the most relevant contributing modes to resonances allowing effective casing design to minimise vibration problems. This workshop will be of interest to all those involved in transmission design for durability, efficiency and NVH performance. Shuxin Jiang, Michal Brezina
17.00	Close

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Friday: May 23, 2025

Realis experts will be available on the final day to answer any of your questions, in an informal setting with coffee and a light buffet.

	Fluid Dynamics, Structural Mechanics, and Systems Engineering
9.00 (CST)	**Q & A** An opportunity to meet the Realis experts and to ask any questions regarding the presented material, specific software questions, or something that might not have been covered in the past 2 days. Meet the following experts from the product and application teams: Evgeniy Shapiro Qingquiang Jiang Nick Tiney Michal Brezina Zhiguo Lu Shuxin Jiang Vratislav Ondrak
12.30	Close