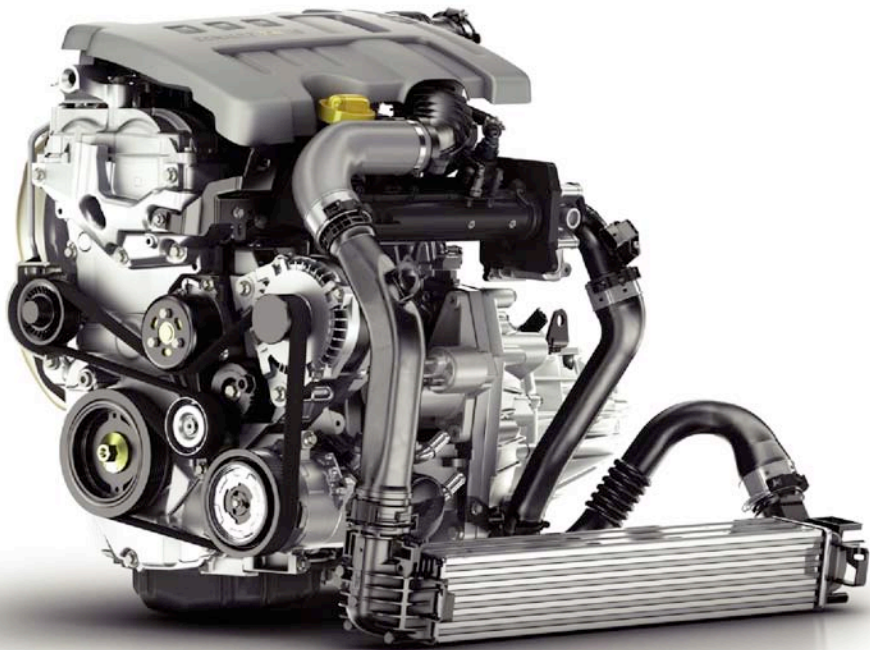


INTERNATIONAL
CONFERENCE AND EXHIBITION

THE SPARK IGNITION
ENGINE OF THE FUTURE

Facing the CO₂ and electrification challenges



December 2 & 3, 2009
INSA de Strasbourg

Context and Objectives

- **Following the success of their 2007 International Conference** on "The Spark Ignition Engine of the Future", the Société des Ingénieurs de l'Automobile (SIA) and The Institute for Reciprocating Engines of Universität Karlsruhe (TH) are pleased to present the second edition of this conference entitled

"The Spark Ignition Engine of the Future: Facing the CO₂ and electrification challenges" on December 2 & 3, 2009 in Strasbourg.

- Whereas the most recent Diesel engines have become well known for their advantages in high efficiency and low CO₂ emissions, the gasoline engine is still the benchmark for its refinement and ultra low pollutant emissions. The main challenge for future gasoline engines, and spark ignition engines in general, is therefore to make significantly progress in fuel efficiency and reduction of CO₂ emissions, whilst keeping their NVH and ultra low pollutant emissions advantages.
- To this end, a resurgence of the spark ignition engine, with diverse technologies and fuels is expected over the coming years. A new generation of spark ignition engines will be introduced with technologies such as turbocharging and downsizing which offer great potential for increased power density and improved thermal efficiency of the gasoline engine. Furthermore, combining other technologies such as direct injection and new valve actuation technologies is providing opportunities for gasoline engines to reduce the gap in fuel efficiency and CO₂ emissions compared to their Diesel counterparts. Apart from conventional concepts, new combustion processes such as Controlled Auto-Ignition (CAI) or Homogeneous Charge Compression Ignition (HCCI) could offer further potential to improve the efficiency while maintaining ultra low engine out emissions. Other avenues for efficiency improvements and CO₂ reductions for spark ignition engines could come from different and alternative fuel types.
- Beside all these new technologies a gradual electrification of the automotive powertrain is coming modifying the specifications of future thermal engines. New features such as stop and start, hybridization, electric network plugging,... will be progressively introduced. This will affect the design characteristics and the role of thermal engines in the automotive powertrains of the future. This represents a new opportunity for the spark ignition engine which is, thanks to its NVH and ultra low emissions advantages, well adapted to evolve in this direction and face this new emerging challenge
- This new SIA international Conference is intended to provide the opportunity for experts from the automotive industry (OEMs and their suppliers), the oil industry, research laboratories and universities to exchange their points of view and information on the potential of the future spark ignition engine to respond to the combined low CO₂ and electrification challenges of the future.

Committee

CHAIRPERSONS:

Pierre DURET – IFP School / SIA

Ulrich SPICHER – Universität Karlsruhe (TH)

ORGANIZING COMMITTEE

Charles BAILLY – Le Moteur Moderne

Philippe BERNET – Renault

Marc CHARLET – MOVEO

Jean FACHE – SIA

Pierre-Yves GEELS – AVL France

Noureddine GUERRASSI – Delphi

Patrick GUILLEMOT – Pôle MTA

Omar HADDED – Tata Motors

Nicolas LE BIGOT – CCFA

Michel LIFERMANN – Valeo

Sylvain MICHON – Volvo Powertrain France

Jean-Jacques MILESI – SIA

Olivier PAJOT – PSA Peugeot Citroën

Thomas RÖLLE – IAV

Rémy SCHMITT – Robert Bosch France

Amin VELJI – Universität Karlsruhe (TH)

SCIENTIFIC COMMITTEE

Laurent BENOIT – PSA Peugeot Citroën

Kurt BLUMENRÖDER – IAV

Frédéric DIONNET – CERTAM

Martial DURGET – Le Moteur Moderne

Gunter FRAIDL – AVL

Raymond FREYMANN – BMW

Bertrand HAUET – Renault

Steffen LUPP – Robert Bosch

Dominique PETITJEAN – Honeywell

Vanessa PICRON – Valeo

Philippe PINCHON – IFP

Walter PIOCK – Delphi Powertrain Systems

Philippe SOUHAITE – PSA Peugeot Citroën

Amin VELJI – Universität Karlsruhe (TH)

Jürgen WILLAND – Volkswagen

Programme - Wednesday 2, December 2009

09:00	Participants registration Welcome opening <i>U. SPICHER – University of Karlsruhe, Germany</i> <i>P. DURET – IFP School, France</i>	
09:30	Opening session - Laurent BENOIT Directeur Ingénierie Avancée Chaînes de Traction et Bases véhicules– PSA Peugeot Citroën	
10:00	Keynote speech Influence of pre-injection on controlled auto-ignition combustion – a theoretical and experimental study <i>W.HÜBNER - BMW Group Research and Technology, Germany</i> <i>U. GERKE - BMW Group Research and Technology, Germany</i> <i>K. BOULOUCOS - Swiss Federal Institute of Technology, Switzerland</i> <i>N. PETERS - RWTH Aachen University, Germany</i> <i>C. SCHULZ - University of Duisburg-Essen, Germany</i> <i>U. SPICHER - University of Karlsruhe (TH), Germany</i>	
10:30	Exhibition Visit / Refreshment Break	
SESSION 1: NEW COMBUSTION PROCESS		
Chairmen: <i>Amin VELJI – Universität Karlsruhe (TH) • Olivier PAJOT – PSA Peugeot Citroën</i>		
11:00	Investigation of HCCI combustion control in a multi-cylinder gasoline engine <i>S. YAMAOKA - Hitachi, Germany</i>	
11:30	Extension of gasoline HCCI operational range by using blowdown supercharging system <i>Y.MORIYOSHI, T.KUBOYAMA - Chiba Univ, Japan</i> <i>K. HATAMURA – Hatamura Engine Lab., Japan</i> <i>T. YAMADA – CDAJ, Japan</i> <i>Y. URATA - Honda R&D, Japan</i>	
12:00	Omnivore: an automotive Flex-Fuel 2-Stroke engine with variable compression ratio, variable charge trapping and direct fuel injection <i>J.W.G. TURNER, D.W. BLUNDELL, D.B. LARKMAN, P. BURKE AND R.J. PEARSON - Lotus Engineering, UK</i> <i>S. RICHARDSON - Jaguar Cars Limited, UK</i> <i>S. BREWSTER - Orbital Corporation Limited, UK</i> <i>R.G. KENNY - Queen's University Belfast, UK</i>	
12:30	Exhibition Visit / Lunch	
SESSION 2 : COLLABORATIVE RESEARCH		SESSION 2 BIS : NEW ENGINE COMPONENTS
ON NON-STEADY SI COMBUSTION		
Chairmen: <i>Henning BOCKHORN – Universität Karlsruhe (TH)</i> <i>Steffen LUPP – Robert Bosch</i>		Chairmen: <i>Thomas RÖLLE – IAV</i> <i>Martial DURGET – Le Moteur Moderne</i>
14:00	Effects of high injection pressures on the upper load limit of spray-guided stratified combustion <i>S. BURI, H. KUBACH, U. SPICHER - University Karlsruhe (TH), Germany</i>	RF ignition system – breakthrough technology for the future SI engine <i>A. AGNERAY, L. MISPREUVE, X. JAFFREZIC, N. MALEK, M. PARIENTE, F. AUZAS, M. MAKAROV, C. NOUVEL, F. DELORAINÉ, F. ROQUE, T. DUMONT, T. MANSION – Renault, France</i>
14:30	Large eddy simulation of the cyclic variations in an internal combustion engine <i>F. MAGAGNATO, A. WALCKER, M.GABI - University Karlsruhe (TH), Germany</i>	A modular ignition solution for low CO ₂ engines <i>O. BRUNEL, L. DUFOUR, O. MATZELARD, D. PASCAL – Electricfil Automotive, France</i>
15:00	Simulation tools in order to assist the development of future gasoline engines <i>R. SCHIEßL, U. MAAS - University Karlsruhe (TH), Germany</i>	Exhibition visit
15:30	Quantitative measurement of soot formation and oxidation in a gasoline direct injection engine <i>M. ROSSBACH, A. VELJI, U. WAGNER, U. SPICHER, R. SUNTZ, H. BOCKHORN - University Karlsruhe (TH), Germany</i>	
16:00	Exhibition Visit / Refreshment Break	
SESSION 3 : EFFICIENCY IMPROVEMENT		SESSION 3 BIS: COMBUSTION MODELLING AND SIMULATION TOOLS
Chairmen: <i>Dominique PETITJEAN – Honeywell</i> <i>Rémy SCHMITT – Robert Bosch France</i>		Chairmen: <i>Stéphane HENRIOT – IFP</i> <i>Ulrich MAAS – Universität Karlsruhe (TH)</i>
16:30	Development and results of a new cylinder deactivation approach: the OValiD® concept <i>C. TERNEL, A. PAGOT, P.ANSELMI, X. GAUTROT – IFP, France</i>	Optimized engine management process applied on TGD engine <i>D. FOURNIGAUULT, N. VITIello, L. VIOLETTE, S. POTTEAU – Valeo, France</i>
17:00	<i>R. SAUERSTEIN - BorgWarner</i>	Combustion modeling of a DISI engine by using the combined flamelet model for non-premixed and premixed combustion <i>H. KWON, K. MIN - Seoul National University, Korea</i>
17:30	Potential of ICE fuel efficiency improvement using thermal energy recovery system (TERS) - key results of the proof of concept <i>F. THEVENOD - Heatzpower, France</i>	Pollutant emissions and fuel efficiency prediction for a downsized SI-engine using a 0-dimensional combustion model <i>S. RICHARD, G. FONT, S. BOUGRINE, F. LE BERR – IFP, France</i>
18:00	End of conference day 1	The organisers reserve the right to make changes to the programme should they be deemed necessary

Programme - Thursday 3, December 2009

SESSION 4 : EGR & BOOSTING

Chairmen:

Gaëtan MONNIER - D2T

Philippe SOUHAITE – PSA Peugeot Citroën

- 09:00 EGR BOOST Concept Development
P. CHRISTOU, T. DUMONT, C. DEHLOUME, B. SERRA, I. BONFAND, JL BOISROUX, I. HELLOT, C. RAMBERT, A. IZAAC – Renault, France
-
- 09:30 Cooled EGR to reduce CO₂ emission and allow stronger downsizing
V. SOUCHON – PSA Peugeot Citroën, France
-
- 10:00 Cooled EGR for a turbo SI engine to reduce knocking and fuel consumption
S. POTTEAU, P. LUTZ, J.S. BERNARD, C. ROCHETTE, J. VOGEL – Valeo, France
-
- 10:30 **Exhibition Visit / Refreshment Break**

SESSION 5 : ALTERNATIVE FUELS

Chairmen:

Jean-Jacques MILESI – SIA

Bertrand HAUET – Renault

- 11:30 Sustainable organic fuels for transport – a concept for affordable mobility using carbon-neutral liquid fuels
R.J. PEARSON, J.W.G. TURNER – Lotus, UK
-
- 12:00 Consideration of ultra-low emissions standards for a dilute spark-ignited engine operating on gasoline, butanol, and E85
T. ALGER, J. GINGRICH, I. ABDUL-KHALEK - Southwest Research Institut, USA
-
- 12:30 **Exhibition Visit / Lunch**

SESSION 6 : THE POWERTRAIN ELECTRIFICATION CHALLENGE

Chairmen:

Michel LIFERMANN – Valeo

Ulrich SPICHER – Universität Karlsruhe (TH)

- 14:00 Gasoline engines and electrification – what is the required effort?
P. KAPUS, P. EBNER – AVL, Austria
M. DURGET – Le Moteur Moderne, France
- 14:30 Range extender for electric vehicles and powertrain for ultra low cost vehicles: a chance for small gasoline DI 2-stroke engines?
P. DURET – IFP School, France
- 15:00 Electromagnetic valve actuation system: a cost effective solution to maximize gain through hybridisation
A. FREDERIC, C. ROCHETTE, N. GELEZ, D. DURRIEU, J. HOBRAICHE, V. PICRON – Valeo, France
- 15:30 **Conclusion Keynote speech**
Rémi BASTIEN – Renault
- 16:00 **End of Conference**

SESSION 4 BIS : CALIBRATION DEVELOPMENT TOOLS

Chairmen:

Charles BAILLY – Le Moteur Moderne

Omar HADDED – TATAR MOTORS

- Comparison of two different model-based calibration approaches for gasoline engine warm-up and catalyst heating on the engine test bench
A. NESSLER, B-U. KÖHLER, W. BAUMANN, K. RÖPKE - IAV, Germany
-
- New combustion analysis in-vehicle technique for speeding up the development phase of engine transient operations
W. SAILER, J-C. LAMODIÈRE - Kistler, France
-
- Model based start optimisation of DISI engines supported by spray analysis tools
J. MAASS, S. LIEBSCH, R. SALIBA, R. DELOUVRIER, O. DINGEL, R. MAROHN – IAV, Germany

SESSION 5 BIS: POLLUTION CONTROL

Chairmen:

Philippe BERNET – Renault

Walter PLOCK – Delphi Powertrain Systems

- Lean Exhaust Gas Aftertreatment for GDI Cost Attractive Solutions for Euro 6
S. ECKHOFF, F. ADAM, S. FRANOSCHEK, R. HOYER, W. MÜLLER – Umicore, Germany
-
- Effect of hydrogen addition in a spark-ignition engine with EGR
F. HALTER, T. TAHTOUH, C. MOUNAÏM-ROUSSELLE - Institut PRISME, Université d'Orléans, France

Registration form

THE SPARK IGNITION ENGINE OF THE FUTURE

Facing the CO₂ and electrification challenges

December 2 & 3, 2009 – Strasbourg, France

Ref: 2009-04

Please complete and return this form to:

SIA – 79, rue Jean-Jacques Rousseau – F-92158 Suresnes Cedex

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REGISTER DIRECTLY ON LINE: www.sia.fr

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■ Registration fees (Tick as appropriate)

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1 160.12 € VAT Incl. (970 € VAT Excl.) Non Members

580.06 € VAT Incl. (485 € VAT Excl.) Researchers, Labs and Small Firms (< 100 people).

0 € . Speakers and Chairmen

Preferential rates for students and retired – For further information, contact us

■ Payment

By check in Euros made payable to: “Société des Ingénieurs de l’Automobile”

By bank transfer in Euros made payable to: **“Société des Ingénieurs de l’Automobile”** (please attach a copy)

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I hereby authorise the organisers to charge my credit card to the amount of €

On my Card n : Expiration date :/.....

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Company stamp:

- Registration fees include participation in the conference, CD of proceedings, book of abstracts, refreshment breaks, lunches and diner.
- Where it is not possible to send the payment together with the form, each registration should be accompanied by an official purchase order. Failing reception of an official purchase order or payment on the day of the symposium, we regret that you will not be allowed entry to the symposium.
- When we have received the registration form, we will send you a confirmation letter and an invoice. Please indicate the accounts department address where necessary.
- In case of cancellation before November 1, 2009, 30% of the registration fees will be retained by the organisers. After this date, the entire registration fee will be retained. Registered participants not able to attend may nominate a substitute. Written notice must be provided.

■ Exhibition, sponsorship & advertisement

The congress will be accompanied by an exhibition where companies will be able to present information to the participants, highlight their new products and create new privileged contacts within this unique gathering of targeted decision-makers. The exhibition will be a focal point, attracting professionals, research institutes and engineers from the automotive industry. **This offer is limited, and it is highly recommended to reserve your space as early as possible.**

You have also the possibility to **maximize your visibility by becoming a sponsor**. With a corporate sponsorship, you gain unmatched recognition as an industry leader and generate an abundance of goodwill. Consider this sponsorship opportunity.

Do not miss the opportunity to **advertise in the congress documents**: a portal to leading decision-makers in the automotive industry.

For further information on exhibition and sponsoring opportunities, please contact

Emilie BONNET

Tel: +33 (0)1 41 44 93 75

Email: emilie.bonnet@sia.fr

■ General information

■ OFFICIAL LANGUAGE

English: no simultaneous translation

■ VENUE / ACCESS

INSA de Strasbourg, France
24 boulevard de la Victoire
67084 STRASBOURG Cedex, France
Phone : 0033 (0)3 88 14 47 00
Fax : 0033 (0)3 88 24 14 90
www.insa-strasbourg.fr

From the train station

5 mn walk from the Tram Station
(rue du Faubourg national).

Tram ligne C (Orange) direction Esplanade. Stop at
"Universités", in front of the Insa de Strasbourg.

From the airport

Take the bus to the Tram station "Baggersee", (every 15mn)
Tram ligne A (red) direction « HautePierre Maillon ».

Stop at « Homme de Fer »

Then take the Tram ligne C (orange) direction « Esplanade
», stop at "Universités" in front of the Insa.

By car

From the south, through A35:

Exit n°4 direction « Place de l'Etoile / Offenburg Kehl ».

Turn left direction « 'Esplanade », (rue Alfred Kestler)

After the bridge, 2nd traffic light, turn left (rue Boston).

At the round about, turn first right, « avenue Charles de
Gaulle »

Then, at the 2nd traffic light, turn left in the « boulevard de
la Victoire » Stop at the 24.

From the north, through A4:

Exit « Place de Haguenau » then « avenue des Vosges ».

At the Saint Maurice Church, take the "rue de
l'Observatoire" on your right, then right in the "boulevard
de la Victoire". Stop at the 24.

■ HOTEL ACCOMMODATION

We have selected a list of the most convenient hotels situated near the "INSA de Strasbourg".

Delegates are encouraged to make their own hotel reservations early, directly with the hotels of their choice

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www.hotel-rohan.com

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