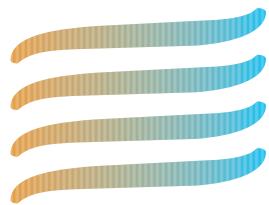




Final Programme

CONFERENCE ON:

# Thermo-and fluid dynamic processes in Diesel Engines



September 10<sup>th</sup> - 13<sup>th</sup>, 2002



UNIVERSIDAD  
POLITECNICA  
DE VALENCIA

ORGANISED BY:

**CMT- MOTORES TÉRMICOS**  
UNIVERSIDAD POLITÉCNICA DE VALENCIA. SPAIN



## Bienvenida a THIESEL 2002

*En nombre propio y de la Universidad Politécnica de Valencia, deseo expresarle el más sincero deseo de bienvenida a esta 2ª Conferencia THIESEL sobre procesos termofluidodinámicos en motores Diesel. Estoy convencido de que su participación en estas jornadas constituye un valor añadido para las mismas. Se produjo durante THIESEL 2000 un intercambio de ideas innovadoras y últimos avances tecnológicos en este campo que fue muy enriquecedor técnica y humanamente, y ello nos ha alentado a seguir adelante para consolidar los vínculos así creados. El transporte representa el corazón de la socioeconomía, de igual modo que el motor es el corazón de la automoción, y en contra de lo que habitualmente ocurre, que el tiempo juega en contra de la fortaleza de los corazones, el motor, ya de por sí centenario, se vigoriza, sobrepasa el límite de las posibilidades de la geometría, de la termofluidodinámica, de la propiedad de los materiales, de los lubricantes...*

*Nuestra Universidad tiene establecida una apuesta clara y permanente por la investigación aplicada. Estamos convencidos de que una de nuestras primeras obligaciones es dar respuesta a las necesidades de la sociedad en cada momento histórico. Sin embargo, no basta el convencimiento, sino que hay que implicarse de corazón en esa carrera para obtener las respuestas adecuadas. Esto lo saben muy bien los que investigan y desarrollan tecnología en este campo. Quizá se deba a ello la jovialidad de espíritu y la ilusión que ponen en sus trabajos los que a esto se dedican.*

*Por ello nos resulta especialmente estimulante que se celebre en estos días la segunda, y esperamos no última, edición de esta conferencia de alto nivel, tanto en lo que se refiere a sus participantes como al interés de los temas que aborda. Consideramos un verdadero honor ser sus anfitriones una vez más. Con la convicción de que la ilusión se contagia, agradecemos la dedicación de todos los que han hecho posible que THIESEL 2002 tenga lugar en la Universidad Politécnica de Valencia, les deseamos que sea todo un éxito y que el corazón resista.*

## Welcome to THIESEL 2002

In my own name and on behalf of the Universidad Politécnica de Valencia, I wish to express my warmest welcome to the second THIESEL Conference on Thermo- and Fluid Dynamic Processes in Diesel engines. I am fully convinced that your participation in this conference adds extra value to the event. The THIESEL 2000 conference brought about an exchange of innovative ideas and the most up-to-date technological advances within this field. It was an enriching experience, from both a technical and human point of view, and it has encouraged us to continue strengthening the bonds established at the time. Transport lies at the heart of society and economy in the same way that the engine is the heart of automotion, but whereas time usually erodes the vitality of hearts, the engine, having been active for more than a century, is still surprisingly vigorous, striving to reach the unexplored limits of geometry, of thermal and fluid dynamics, of materials, of lubricants...

Our University has a clear and permanent vocation for applied research. We are convinced that one of our main duties is to give due answers to constantly evolving societal needs. However, this conviction is not enough. We must take these needs to heart and fully dedicate ourselves to their solution. This is well known by all those carrying out research and development in this field, and it is perhaps for this reason that they put so much spirit and enthusiasm into their work.

This is why we find the prospect of this second, and hopefully not last, high level Conference so exciting, especially considering the prestige of the participants and the relevance of the topics under discussion. We feel highly honoured to be your hosts once again. With the belief that enthusiasm is contagious, we want to acknowledge the dedication of all those who have made it possible to hold the THIESEL 2002 Conference at the Universidad Politécnica de Valencia and to express our best wishes for its success and its spirit.

Prof. JUSTO NIETO

RECTOR DE LA UNIVERSIDAD POLITÉCNICA DE VALENCIA



### ORGANISING COMMITTEE

- Prof. J. H. WHITELAW** / MED. Imperial College London - U.K.  
**Prof. F. PAYRI** / CMT. UP Valencia - SPAIN  
**Prof. C. ARCOUMANIS** / SE. City U. London - U.K.  
**Prof. J. M. DESANTES** / CMT. UP Valencia - SPAIN

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**Mr. Ph. PINCHON** / IFP - FRANCE  
**Prof. R. D. REITZ** / U. Wisconsin - Madison - U.S.A.  
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**Dr. K. P. SCHINDLER** / Volkswagen - GERMANY  
**Dr. D. SIEBERS** / Sandia Nat. Lab. - USA  
**Prof. F. TINAUT** / U. Valladolid - SPAIN  
**Dr. C. VAFIDIS** / CR Fiat - ITALY

### CONFERENCE COORDINATOR

- Dr. X. MARGOT** / CMT. UP Valencia - SPAIN

**Conference Objectives** THIESEL 2002 is the second international conference on 'Thermo-and Fluid Dynamic Processes in Diesel Engines' organised by CMT-Motores Térmicos of the Universidad Politécnica de Valencia. It is meant to widen and further consolidate the links created during and as an aftermath of the THIESEL 2000 conference, held in Valencia in September 2000. The latter raised great interest in the automotive industry and associated research community and it is expected that THIESEL 2002 will be at least as successful.

New and advanced technologies in the fields of fuel injection and combustion, air management and exhaust after-treatment have to be further developed if Light and Heavy Duty Diesel engines are to transport us into an environmentally friendly future. As regulations impose increasingly restrictive emission and low fuel consumption levels, engine developers face the challenging task of complying with them, while responding to the customers' requirements of high specific power, driveability, and comfort. By bringing together ideas and experiences from both Industry and University, the conference should represent a step towards progress. It will address all aspects related to thermal and fluid dynamic processes in Diesel engines, from basic studies aimed at a better understanding of the physical processes underlying Diesel engine operation, to real day-to-day problems associated with engine development. In the general scope adopted, areas ranging from the use, in basic combustion research, of sophisticated tools such as advanced experimental diagnosis, complex analysis and simulation, to that of more robust design tools in current industrial practice will be covered. The exchange of information through the discussion of recent advances should benefit the development of Diesel engines and help identify future research areas.

**Conference overview** The conference will be held over three and a half days. On the first day, in the afternoon of Tuesday 10<sup>th</sup> of September, there will be the official opening including a welcome address and a welcome cocktail. Registration will be open for participants on Tuesday afternoon and on Wednesday morning. Since the conference schedule is fairly tight, participants are encouraged to register on Tuesday afternoon whenever possible. The technical sessions will start on Wednesday morning the 11<sup>th</sup> of September and will conclude on Friday the 13<sup>th</sup> of September in the afternoon. In total, 44 papers are scheduled, including 6 keynote addresses by prestigious names of the Diesel automotive area. Within the sessions speakers will be given 30 min. for their presentation comprising a brief discussion with other participants. A gala dinner will be offered to participants on the 13<sup>th</sup> of September to close the conference on a happy relaxed note. The favourable response of the Diesel engine community to the previous THIESEL conference and to THIESEL 2002, suggests a promising future for THIESEL 2004 and its following editions.

### About UPV/CMT - Motores Térmicos

The Universidad Politécnica de Valencia is a Technical University and was founded in 1971. The University has seven Superior Schools (5 annual courses) and eight Technical Schools (3 annual courses), with about 32.000 students and a teaching staff of 2.200.

CMT - Motores Térmicos is a University Department and a University Research Institute at the same time. Founded in 1979, it is nowadays composed by about 100 members including professors, researchers, laboratory technicians and administrative staff.

CMT - Motores Térmicos has become a very active group involved in many R&D projects supported by private companies as well as by public funds, including several European research programs. Research areas in which the group is active include all topics related to thermo-and fluid dynamic processes in internal combustion engines - air management, fuel injection and combustion, pollutant formation and control, noise generated by flow and combustion, etc... - with a focus on Diesel automotive engines. The group also works in the development and application of experimental techniques for engine research. The research philosophy of the group combines theoretical/modelling and experimental work to improve knowledge on the basic processes, while providing solutions for the European automotive industry demands.

The laboratory of CMT - Motores Térmicos is equipped with state-of-the-art experimental facilities and test benches for Diesel engines that allow close control of all experimental variables even at sub-zero ambient temperature. The laboratory also has very modern visualisation, image processing and laser based techniques (including LDA / PDA, LII, PIV and LIF) as well as injection rate and spray momentum measurement capabilities.



- 1 Paraninfo - Conference Building
- 2 CMT - Motores Térmicos
- 3 C.M. Galileo Galilei
- 4 Restaurant "La Vella"

UNIVERSIDAD POLITÉCNICA DE VALENCIA

# SESSION MATRIX

	Tuesday, September 10 <sup>th</sup>	Wednesday, September 11 <sup>th</sup>	Thursday, September 12 <sup>th</sup>	Friday, September 13 <sup>th</sup>
7:30/8:30		CONFERENCE REGISTRATION		
8:30/10:30	SESSION A.1. "INJECTION & SPRAYS (I)"	SESSION A.1. "INJECTION & SPRAYS (I)"	SESSION C.1. "COMBUSTION & EMISSIONS (I)"	SESSION E.1. "COMBUSTION MODELLING (I)"
10:30/11:00	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK
11:00/13:00	SESSION A.2. "INJECTION & SPRAYS (II)"	SESSION A.2. "INJECTION & SPRAYS (II)"	SESSION C.2. "COMBUSTION & EMISSIONS (II)"	SESSION E.2. "COMBUSTION MODELLING (II)"
13:00/15:30	LUNCH	LUNCH	LUNCH	LUNCH
15:30/17:30	SESSION B.1. "HOMOGENEOUS CHARGE C.I."	SESSION B.1. "HOMOGENEOUS CHARGE C.I."	SESSION D.1. "AIR MANAGEMENT"	SESSION F.1. "EXPERIMENTAL TECHNIQUES (I)"
17:30/18:00	CONFERENCE REGISTRATION	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK
18:00/19:30	SESSION B.2. "INJECTION & SPRAYS (III)"	SESSION B.2. "INJECTION & SPRAYS (III)"	SESSION D.2. "FUELS"	SESSION F.2. "EXPERIMENTAL TECHNIQUES (II)"
19:30/20:00	WELCOME ADDRESS			CLOSURE ADDRESS
20:00/22:00	WELCOME COCKTAIL			
21:30/24:00				GALA DINNER

**CONFERENCE REGISTRATION**

7:30/8:30

**SESSION A.1. INJECTION & SPRAYS (I)**

8:30/10:30

Chairman: J.Whitelaw. IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY & MEDICINE (U.K.)

Keynote address:  
B. MAHR

"FUTURE AND POTENTIAL OF DIESEL INJECTION SYSTEMS"  
B. Mahr. ROBERT BOSCH (GERMANY)

"NOZZLE FLOW AND SPRAY CHARACTERISTICS FROM VCO DIESEL INJECTOR NOZZLES"  
C. Arcoumanis and M. Gavaises. CITY UNIVERSITY (U.K.); H. Roth and Y.S.Choi. IMPERIAL COLLEGE LONDON (U.K.); A. Theodorakakos. NTU ATHENS (GREECE)

"PHOTOGRAPHICAL ANALYSIS OF INITIAL BREAKUP PROCESS OF DIESEL SPRAY"  
H. Hattori and K. Narumiya. OSAKA SANGYO UNIVERSITY (JAPAN)  
M. Tsue. UNIVERSITY OF TOKYO (JAPAN). T. Kadota. OSAKA PREFECTURE UNIVERSITY (JAPAN)

"A STUDY OF LIQUID PHASE STRUCTURE IN VERY HIGH PRESSURE COMMON RAIL DIESEL INJECTION USING OPTICAL DIAGNOSTICS"  
G. Bruneaux and C. Lemenard. INSTITUT FRANÇAIS DU PETROLE (FRANCE)

**COFFEE BREAK**

10:30/11:00

**SESSION A.2. INJECTION & SPRAYS (II)**

11:00/13:00

Chairman: D. Schoeppe. DELPHI DIESEL SYSTEMS (FRANCE)

"THE INFLUENCE OF INJECTOR PARAMETERS ON DIESEL SPRAY"  
C. Bae, J. Yu and J. Kong. KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KOREA)  
R. Cuenca and K. O. Lee. ARGONNE NATIONAL LABORATORY (U.S.A.)

"WALL-IMPINGEMENT ANALYSIS OF A SPRAY FROM A COMMON RAIL INJECTION SYSTEM FOR DIESEL ENGINES"  
L. Allocca. ISTITUTO MOTORI CNR (ITALY); A. De Vita and L. Di Angelo. UNIVERSITA DE L' AQUILA (ITALY)

"EXPERIMENTAL VALIDATION OF A SPRAY BREAKUP MODEL IN HIGH PRESSURE AMBIENT CONDITIONS"  
S. Ubertini. UNIVERSITY OF ROME "TOR VERGATA" (ITALY)  
F. Mariani and L. Postriotti. UNIVERSITY OF PERUGIA (ITALY)

"STUDY ON A DIESEL COMMON RAIL SPRAY DEVELOPMENT SEPARATED FROM SHOT TO SHOT VARIATION"  
W. Reckers, J. F. Lucchini, R. Kneer and P. Spadafora. DELPHI AUTOMOTIVE SYSTEMS (LUXEMBOURG)

**LUNCH**

13:00/15:30

**SESSION B.1. HOMOGENEOUS CHARGE C.I.**

15:30/17:30

Chairman: N. Jackson. RICARDO CONSULTING ENGINEERS (U.K.)

Keynote address:  
K. P. SCHINDLER

"DIESEL ENGINES AND THEIR IMPACT ON THE ENVIRONMENT"  
K. P. Schindler. VOLKSWAGEN (GERMANY)

"A STUDY ON COMBUSTION STRUCTURE OF PREMIXED COMPRESSION IGNITION DIESEL ENGINES"  
H. Yanagihara. TOYOTA MOTOR EUROPE (BELGIUM)

"DEVELOPMENT OF THE HIGH POWER NADI™ CONCEPT USING DUAL MODE DIESEL COMBUSTION TO ACHIEVE ZERO NO<sub>x</sub> AND PARTICULATE EMISSIONS"  
B. Gatellier and B. Walter. INSTITUT FRANÇAIS DU PETROLE (FRANCE)

"MIXTURE FORMATION AND COMBUSTION CONTROL FOR LOW EMISSION DI DIESEL COMBUSTION WITH HCCI-CHARACTERISTICS"  
A. Groenendijk and E. Müller. TECHNICAL UNIVERSITY OF BRAUNSCHWEIG (GERMANY)

**COFFEE BREAK**

17:30/18:00

**SESSION B.2. INJECTION & SPRAYS (III)**

18:00/19:30

Chairman: N.Kyrtatos. NATIONAL TECHNICAL UNIVERSITY OF ATHENS (GREECE)

"MODELLING OF TWO-PHASE FLOWS: AN EULERIAN MODEL FOR DIESEL INJECTION"  
G. Blokkeel. PSA PEUGEOT CITROËN (FRANCE); F. X. Demoulin. CORIA-UNIVERSITE DE ROUEN (FRANCE); R. Borghi. E.S.M. 2-UNIVERSITE DE AIX-MARSEILLE II (FRANCE)

"EFFECT OF INJECTION CONDITIONS ON PENETRATION AND DROP SIZE OF HCCI DIESEL SPRAYS"  
A. Coghe and L. Araneo. POLITECNICO DI MILANO (ITALY)

"DEVELOPMENT OF TRANSIENT HYDROGEN JETS IN HIGH-SWIRL FLOW FIELDS"  
T. Kamimoto, T. Kohama, H. Seki and T. Yamamoto. TOKAI UNIVERSITY (JAPAN)  
Y. Moriyoshi. CHIBA UNIVERSITY (JAPAN)

**SESSION C.1. COMBUSTION & EMISSIONS (I)**  
 Chairman: **W. Knecht. IVECO MOTORENFORSCHUNG (SWITZERLAND)**

8:30/10:30

Keynote address:  
**K. BINDER**

"PRESENT AND FUTURE OF HEAVY DUTY ENGINES STRATEGIES FOR COMPLIANCE TO THE EMISSION LEGISLATION "  
 K. Binder. DAIMLERCHRYSLER (GERMANY)

"INJECTION PRESSURE AND ORIFICE DIAMETER EFFECTS ON SOOT IN DI DIESEL FUEL JETS "  
 D. L. Siebers and L. M. Pickett. SANDIA NATIONAL LABORATORIES (U.S.A.)

"ESTIMATION OF DIESEL PARTICULATE EMISSIONS FROM HYDROCARBON EMISSIONS AND SMOKE OPACITY"  
 M. Lapuerta, O. Armas, J. J. Hernández and R. Ballesteros. UNIVERSIDAD DE CASTILLA-LA MANCHA (SPAIN)

"EFFECT OF STRATIFIED RICH AND HIGH TURBULENCE COMBUSTION ON THE REDUCTION OF NO<sub>x</sub> AND PARTICULATE EMISSIONS FROM A DI DIESEL ENGINE"  
 Y. Kidoguchi, K. Miwa and E. Goda. THE UNIVERSITY OF TOKUSHIMA (JAPAN)

**COFFEE BREAK**

10:30/11:00

**SESSION C.2. COMBUSTION & EMISSIONS (II)**  
 Chairman: **J. Pérez. PSA PEUGEOT CITROËN (FRANCE)**

11:00/13:00

"ANALYSIS OF COMBUSTION CHAMBER RESONANCE IN DI AUTOMOTIVE DIESEL ENGINES"  
 A. Torregrosa, A. Broatch and V. Marant. CMT-MOTORES TERMICOS. UNIVERSIDAD POLITECNICA DE VALENCIA (SPAIN); Y. Beauge. PSA PEUGEOT CITROËN (FRANCE)

"OPTIMIZING THE MULTIPLE INJECTION SETTINGS ON HSDI DIESEL ENGINE"  
 J. C. Ricaud. LE MOTEUR MODERNE (FRANCE); F. Lavoisier. RENAULT (FRANCE)

"COMBUSTION DEVELOPMENT FOR EURO 4"  
 M. Lejeune, D. Lortet and S. Michon. RENAULT VI POWERTRAIN (FRANCE)

"INVESTIGATION CONCERNING THE EFFECT OF POST FUEL INJECTION ON THE PERFORMANCE AND POLLUTANTS OF HEAVY DUTY DIESEL ENGINES USING A MULTI ZONE COMBUSTION MODEL"  
 D. T. Hountalas, D.A. Kouremenos and E. G. Pariotis. NATIONAL TECHNICAL UNIVERSITY OF ATHENS (GREECE); V. Schwarz, K. Binder. DAIMLERCHRYSLER (GERMANY)

**LUNCH**

13:00/15:30

**SESSION D.1. AIR MANAGEMENT**  
 Chairman: **H. Tennant. HOLSET TURBOCHARGERS (U.K.)**

15:30/17:30

Keynote address:  
**P. MAREZ**

"PRESENT AND FUTURE OF SMALL DIESEL ENGINES AND STRATEGIES FOR COMPLIANCE TO THE EMISSIONS LEGISLATIONS"  
 P. Marez. PSA PEUGEOT CITROËN (FRANCE)

"UNSTEADY EFFECTS, ELECTRIC ASSISTED SYSTEMS AND FUTURE TRENDS IN TURBOCHARGER TURBINES"  
 R. Martínez-Botas. IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY AND MEDICINE LONDON (U.K.)

"EXPERIMENTAL STUDY AND MODELLING FOR PIPE SYSTEMS OF I.C.E. WITH AREA CHANGES"  
 D. Chalet, P. Chessé, J-F. Hétet, M. Violleau and X. Tauzia. ECOLE CENTRALE DE NANTES (FRANCE)

"AN INTEGRATED APPROACH FOR THE DESIGN OF DIESEL ENGINE EXHAUST SYSTEMS TO MEET EURO 4 AND BEYOND EMISSIONS LEGISLATIONS"  
 C. Wassermayr, W. Brandstätter. UNIVERSITY OF LEOBEN (AUSTRIA)  
 P. Prenninger. AVL (AUSTRIA)

**COFFEE BREAK**

17:30/18:00

**SESSION D.2. FUELS**  
 Chairman: **H. Pleimling. FEV MOTORENTECHNIK (GERMANY)**

18:00/19:30

"FUEL REQUIREMENTS FOR HCCI ENGINE OPERATION"  
 T. Ryan and A. Matheaus. SOUTHWEST RESEARCH INSTITUTE (U.S.A.)

"BENEFITS OF WATER-FUEL EMULSION ON AUTOMOTIVE DIESEL EXHAUST EMISSION"  
 K. Lombaert, L. Le Moyne, P. Guibert and J. Tardieu de Maleissye. LABORATOIRE DE MECANIQUE PHYSIQUE, CNRS (FRANCE); J. Amouroux. LABORATOIRE DE GENIE DES PROCEDES PLASMA ET DE TRAITEMENT DE SURFACE, ENSCP (FRANCE)

"HYDROGEN AND BIODIESEL MIXTURES AS FUELS FOR THE COMPRESSION IGNITION ENGINE"  
 L. K. S. Teo, A. Tsolakis, A. Megaritis and M. L. Wyszynski. UNIVERSITY OF BIRMINGHAM (U.K.)

**SESSION E.1. COMBUSTION MODELLING (I)**

8:30/10:30

Chairman: P. Anrigo. RENAULT A. (FRANCE)

Keynote address:  
R. D. REITZ"OPTIMIZATION OF IC ENGINE DESIGN FOR REDUCED EMISSIONS USING CFD MODELLING"  
R. D. Reitz and R.P. Hessel. UNIVERSITY OF WISCONSIN-MADISON (U.S.A.)"THE INFLUENCE OF SWIRL AND INJECTION PRESSURE ON POST-COMBUSTION  
TURBULENCE IN A HSDI DIESEL ENGINE"  
P. C. Miles and M. Mergele. SANDIA NATIONAL LABORATORIES (U.S.A.); Z. Nagel, Y. Liu and R.D. Reitz.  
UNIVERSITY OF WISCONSIN-MADISON (U.S.A.); V. Sick. UNIVERSITY OF MICHIGAN (U.S.A.)"CFD FOR COMBUSTION CHAMBER DEVELOPMENT: INFLUENCE OF VALVE POCKETS  
ON THE COMBUSTION PROCESS"  
M. Truant, S. Dehoux and P. Gastaldi. RENAULT A. (FRANCE)"3D-CFD DIESEL COMBUSTION AND ACCURATE HEAT TRANSFER MODELLING FOR DIESEL ENGINES"  
K. J. Wieser and A. O. Ennemoser. AVL (AUSTRIA)**COFFEE BREAK**

10:30/11:00

**SESSION E.2. COMBUSTION MODELLING (II)**

11:00/13:00

Chairman: H. Schulte. FORD FORSCHUNGSZENTRUM AACHEN (GERMANY)

"APPLICATION OF CFD ANALYSIS TECHNIQUES TO DEVELOPMENT OF HIGH  
PERFORMANCE HSDI COMBUSTION SYSTEMS"  
D. J. Rawlins and T. A. Downes. RICARDO CONSULTING ENGINEERS (U.K.)"FURTHER DEVELOPMENT OF A COMPUTATIONAL MODEL FOR HSDI DIESEL ENGINES WITH  
HIGH-PRESSURE COMMON RAIL FUEL INJECTION"  
S. Khalil Arya, F. J. Wallace and G. H. Hawley. UNIVERSITY OF BATH (U.K.)"DEVELOPMENT AND APPLICATION OF A SEMI-EMPIRICAL NO<sub>x</sub> MODEL TO VARIOUS HD DIESEL ENGINES"  
U. Gärtner, H. Daudel and H. Oelschlegel. DAIMLERCHRYSLER (GERMANY)  
G. Hohenberg. TECHNICAL UNIVERSITY OF DARMSTADT (GERMANY)"1-D CYCLE SIMULATION EXEMPLIFIED AS A HELPFUL TOOL WITHIN THE SCOPE OF  
TRUCK ENGINE DEVELOPMENT"  
J. Weiss. MAN NUTZFAHRZEUGE (GERMANY)**LUNCH**

13:00/15:30

**SESSION F.1. EXPERIMENTAL TECHNIQUES (I)**

15:30/17:30

Chairman: A. Douaud. INSTITUT FRANÇAIS DU PETROLE (FRANCE)

Keynote address:  
H. HIROYASU"OPTICAL TECHNIQUES FOR DIESEL SPRAYS AND COMBUSTION"  
H. Hiroyasu. KINKI UNIVERSITY (JAPAN); Takaya. HIGASHI HIROSHIMA (JAPAN)"LIEF MEASUREMENT AND CALCULATION ANALYSIS OF EVAPORATING SPRAY"  
Y. Kim, M. Kim, J. Yeom and K. Min. SEOUL NATIONAL UNIVERSITY (KOREA)"OPTICAL INVESTIGATION OF INJECTION STRATEGY AND SWIRL NUMBER EFFECTS ON THE  
COMBUSTION PROCESS IN A SMALL HSDI C.R. DIESEL ENGINE"  
O. Pajot. PSA PEUGEOT CITROËN (FRANCE); A. Trueba. CENTRALE RECHERCHE (FRANCE)"PARTICULATE MEASUREMENTS BY A NEW ANALYZING TECHNIQUE FOR SUPER-LOW MASS PM"  
H. Fukushima, M. Adachi and S. Nakamura. HORIBA (JAPAN)  
L. Hill. HORIBA INSTRUMENT (U.K.)**COFFEE BREAK**

17:30/18:00

**SESSION F.2. EXPERIMENTAL TECHNIQUES (II)**

18:00/19:00

Chairman: F. Tinaut. UNIVERSIDAD DE VALLADOLID (SPAIN)

"MEASUREMENTS AND IMPROVEMENTS OF CYLINDER-TO-CYLINDER VARIATIONS OF  
EGR DISTRIBUTION IN A DI DIESEL ENGINE"  
D. Nam, J. Lee and K Min Chun. YONSEI UNIVERSITY (KOREA)"NEW WAYS TO MEASURE PRESSURE INSIDE DIESEL ENGINES WITHOUT  
THE USE OF INDIVIDUAL BORE HOLES"  
R. Sonntag, S. Brechbühl, M. Schnepf and P. Wolfer. KISTLER INSTRUMENTE (SWITZERLAND)**CLOSURE ADDRESS**

19:00/19:30

**GALA DINNER**

21:30/24:00



CONFERENCE LOCATION AND DATE

- The conference will take place in the Conference Building of the Universidad Politécnica de Valencia known as 'Paraninfo' on September 10<sup>th</sup> – 13<sup>th</sup>, 2002.

SCHEDULE

- Final paper to be submitted by: 15<sup>th</sup> June 2002**

Final papers should be sent to the Conference Secretariat in electronic (both Word and pdf) and printed versions by this date. The Conference Organisation will do the appropriate edition of the complete manuscript to be published as Conference Proceedings.

CONFERENCE SECRETARIAT

- CMT-MOTORES TÉRMICOS**  
UNIVERSIDAD POLITÉCNICA DE VALENCIA  
CAMINO DE VERA S/N  
46022 Valencia. Spain  
Tel: +34 963 877 650 • Fax: +34 963 877 659  
**e-mail: secrecon@mot.upv.es**

For updated information on the organisation of the conference please visit the web site:

[http:// www.cmt.upv.es](http://www.cmt.upv.es)

REGISTRATION FEES

- The registration fee is 450 € for early registration and 600 € for late registration received after 10<sup>th</sup> July 2002.

The fee will include:

- Attendance to the conference sessions
- Conference Proceedings book
- Coffee breaks and lunches during the conference
- Welcome reception and closure gala dinner
- Transfer by bus to and from conference hotels and conference site.

Registration forms and payments should be sent per mail, fax or e-mail to the Congress Office Ultramar Express (address given below). Registration forms are also available on the conference web site:

[http:// www.cmt.upv.es](http://www.cmt.upv.es)

TRAVEL AND ACCOMMODATION

- Travel and accommodation may be arranged through:

**ULTRAMAR EXPRESS - CONFERENCE OFFICE**

Gran Vía Marqués del Turia, 49, 7<sup>o</sup>, 3<sup>a</sup>  
46005 Valencia, Spain  
Tel. +34 963 528 161 • Fax. +34 963 941 158  
**e-mail: uexopevlc@uex.es**

Iberia and Renfe are acknowledged to be official transport companies for the THIESEL 2002 Conference. On presentation of the enclosed coupons, Iberia will offer a 25% discount off Business and Tourist class prices for national, European and intercontinental flights to attend the conference, while Renfe will offer a 25% discount off prices for high speed trains, and 30% for main line, regional and commuter trains within Spain.

The Conference Organisation has booked rooms at a preferential rate for participants in the following hotels:

- **HOTEL MELIÁ REY D. JAIME\*\*\*\***  
Avenida de Baleares, 2  
Single room: 118,97 €  
Double room: 135,05 €
- **HOTEL NH CIUDAD DE VALENCIA\*\*\***  
Avenida del Puerto, 214  
Single room: 106,11 €  
Double room: 115,75 €
- **C.M. GALILEO GALILEI**  
Hall of Residence on the University Campus  
Avenida de los Naranjos s/n  
Single room: 40,51 €  
Double room: 62,25 €

Please indicate your preference in the enclosed registration form. Prices are per room and night and include breakfast and taxes. Early booking is recommended to ensure availability of a room in the hotel of your choice. Due to accommodation problems in the city of Valencia where many events and fairs take place, no room will be guaranteed after July 8<sup>th</sup>, 2002.

If you intend to bring an accompanying person, please indicate so in the registration form. The Conference Office Ultramar Express has planned a few tourist activities for accompanying persons. For more information, see the 'Social programme' section.



## SOCIAL PROGRAMME

- A social programme for participants will be arranged including a welcome reception on Tuesday 10<sup>th</sup> September evening. The closure gala dinner will be held on Friday evening 13<sup>th</sup> September at the Masía de San Antonio, a typical old Valencian noble farmhouse set in the heart of an orange grove. Accompanying persons are warmly welcome to these events (gala dinner price for accompanying persons: 70 €).

In addition, the Conference Organisation will prepare a visit to the CMT-Motores Térmicos laboratories on Tuesday afternoon 10<sup>th</sup> September and on Saturday morning 14<sup>th</sup> September for interested participants. If possible, please acknowledge your interest by sending an e-mail to the Conference Secretariat.

## EXCURSIONS PROGRAMME

- A special tourist programme of excursions to nearby places of interest will be organised for accompanying persons. The following tours are planned:

### • City of Valencia (on Wednesday 11<sup>th</sup> September)

Sightseeing along the Turia former river bed (now, the Turia gardens), Contemporary Art Museum (IVAM), Serrano Towers, Turia bridges, San Pio V Museum, Puerta del Mar, Hall of Music and City of Arts and Sciences.

The tour continues towards the old town of Valencia, past the bullring, rail station, City Hall square. In the old city centre, La Lonja building (UNESCO 1996), Central Market, Plaza Redonda, Cathedral, San Vicente Crypt, Plaza de la Virgen and Basilica de la Virgen de los Desamparados.

(minimum 15 persons)

### • City of Arts and Sciences (on Thursday 12<sup>th</sup> September)

Visit of Principe Felipe Museum of Science (2 h duration) and

Hemispheric at the heart of the beautiful and modern City of Arts and Sciences. It will be combined with a sightseeing tour of the national park of La Albufera and its lagoon. Lunch included.

(minimum 15 persons)

### • Sagunto – El Puig de Santa Maria (on Friday 13<sup>th</sup>)

Visit of Sagunto, an old Roman city that comprises a restored theater as well as the well conserved remains of a castle set on a hill; a sightseeing tour of the old Sagunto district will be included.

Visit to Santa Maria de El Puig monastery: the construction of this building started in the 13<sup>th</sup> century. It is still occupied by a religious community, the Mercedarios monks.

(minimum 15 persons)

**IMPORTANT NOTICE:** Since a minimum number of persons are required for these excursions to take place, advance booking through the Conference Office is encouraged.

## ABOUT VALENCIA

- Valencia is a cosmopolitan city on the East Coast of Spain, with easy access to some splendid holiday resorts such as those on the Costa Blanca and Costa del Azahar, and not far from the Balearic Islands. Valencia itself is a fascinating place, which has a characteristic blend of historical tradition - with interesting examples of Middle Age and Renaissance architecture-, exciting nightlife, excellent weather and world-renowned festivals and regional cuisine. For shopping sprees enthusiasts, there are several shopping centres within easy reach of the city centre.

Valencia beach is an ideal place to spend time sunbathing and swimming. You may also enjoy a nice walk under the palm trees shadow of the 'Paseo marítimo' that lines the sea and taste some of the typical aperitifs on one of the numerous terraces of the beach restaurants. We will be happy to recommend some restaurants where you can taste the traditional 'Paella Valenciana' or any of the dozen rice dishes that Valencian people have invented.

We hope that you will enjoy your stay in this Mediterranean city.

## HOW TO REACH VALENCIA

- By plane: Valencia has an international airport, Manises, located at approximately 4 kms. from the city. There are regular scheduled national and international flights from several European airlines. A regular bus line links the airport to the Central Bus Station of Valencia, located not far from the city centre.
- By road: The city of Valencia also offers excellent communication by road. The A-7 Mediterranean Motorway that runs north to south provides easy connection to Cataluña and France in the north and to Alicante, Murcia and Andalucía in the south. There are also good road connections to the rest of Spain, in particular the N-III dual motorway to Madrid.
- By rail: Valencia has also very good train connections. The high speed train Euromed links several times a day Barcelona to Valencia in approximately 3 hrs. The journey between Madrid and Valencia by the regular high speed link Alaris takes little over 3 hrs. 30 min.

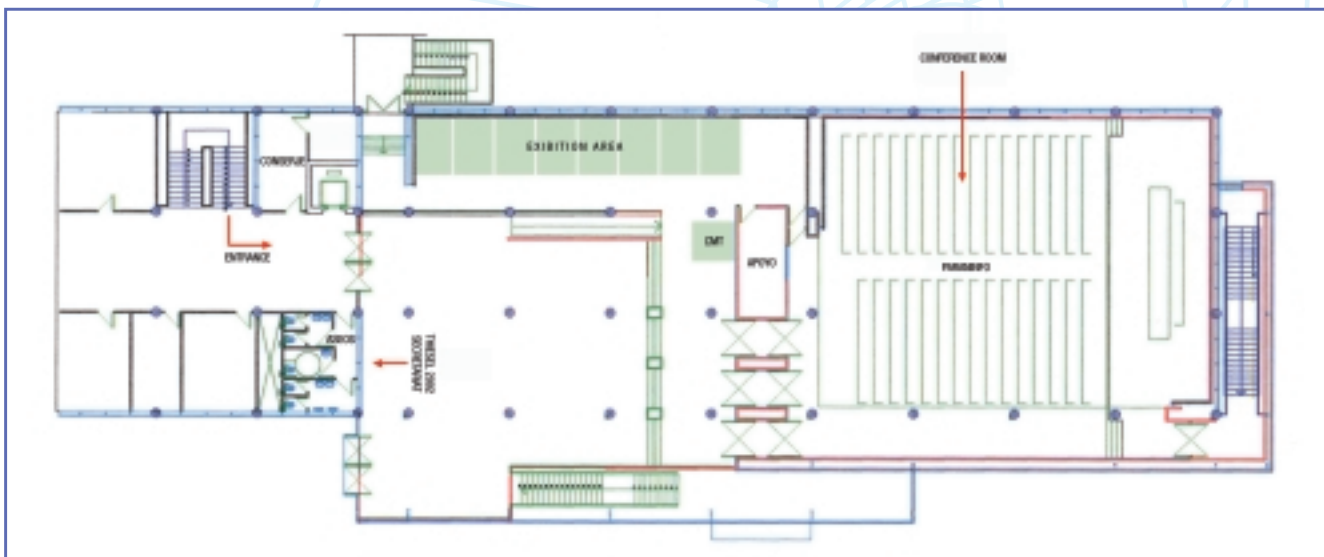


## CONFERENCE EXHIBITION

- There will be an exhibition with a limited number of stands in the entrance hall of the conference room. Several prestigious international companies related to the Diesel engine research and development have agreed to participate to the conference by exhibiting a stand. Conference participants will be encouraged to visit this exhibition in the afternoon of 10th September and during the coffee and lunch breaks.

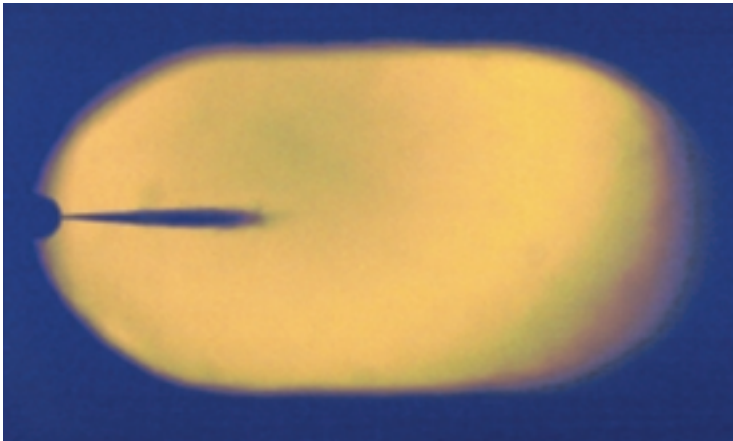
## LIST OF EXHIBITORS

- **ALAVA INGENIEROS - TSI**  
C/ Estebanez Calderón, 5 - 4º  
28020 Madrid. Spain  
Tel: +34 915 679 700 • Fax: +34 915 702 661  
WEB sites: <http://www.alava-ing.es>  
<http://www.tsi.com>
- **ARIES INGENIERIA Y SISTEMAS, S.A.**  
**KISTLER INSTRUMENTE AG**  
Pº Castellana, 163  
28046 Madrid. Spain  
Tel: +34 915 702 737 • Fax: +34 915 702 766  
WEB sites: <http://www.aries-ingenieria.com>  
<http://www.kistler.com>
- **AVL**  
Avda. Maresme, 449  
08301 Mataró. Spain  
Tel: +34 937 554 848 • Fax: +34 937 907 717  
WEB site: <http://www.avl.com>
- **FLUENT France**  
Immeuble Central Gare  
1 place Charles de Gaulle  
78180 Montigny Le Bretonneux. France  
Tel: +33 1 30 60 98 97 • Fax: +33 1 30 64 98 43  
WEB site: <http://www.fluent.com>
- **LA VISION GmbH**  
Anna-Vandenhoeck-Ring 19  
37081 Göttingen. Germany  
Tel: +49 551 9004-0 • Fax: +49 551 9004-100  
WEB site: <http://www.lavision.de>
- **NAGARES, S.A.**  
Carretera Madrid-Valencia Km 196  
16200 Motilla del Palancar. Spain  
Tel: +34 969 180 021 • Fax: +34 969 331 131  
WEB site: <http://www.nagares.com>
- **ROBERT BOSCH GmbH**  
P.O Box 10 60 50  
70049 Stuttgart. Germany  
Tel: +49 711 81137718 • Fax: +49 711 81137769  
WEB site: <http://www.bosch.com>
- **TCA TÉCNICAS DE CONTROL Y ANÁLISIS, S.A.**  
Gerard Piera, 3  
08028 Barcelona. Spain  
Tel: +34 934 091 280 • Fax: +34 934 112 335  
WEB sites: <http://www.emd.horiba.com>  
<http://www.horiba.com>

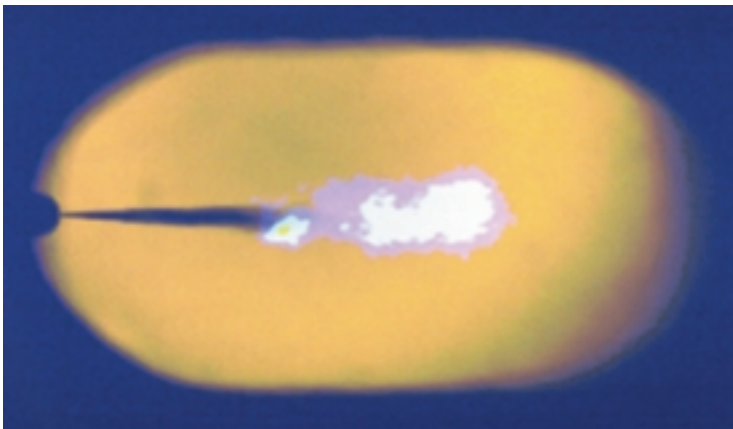




September 10<sup>th</sup>-13<sup>th</sup>, 2002



Liquid-phase spray visualization (back lighting)



Simultaneous liquid spray and autoignition visualization (back lighting and CH radical chemiluminescence)



Flame visualization (soot luminosity)

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DE PROFESIONALES  
DE AUTOMOCIÓN

COLLABORATION:



### CMT-MOTORES TÉRMICOS

UNIVERSIDAD POLITÉCNICA DE VALENCIA  
CAMINO DE VERA S/N. 46022 VALENCIA. SPAIN  
Tel.: +34 963 877 650 • Fax: +34 963 877 659  
e-mail: [secrecon@mot.upv.es](mailto:secrecon@mot.upv.es)

For updated information on the organisation of the Conference please visit the web site:

[http:// www.cmt.upv.es](http://www.cmt.upv.es)