Les Rencontres Scientifiques
d'IFP Energies nouvelles

Rueil-Malmaison, France ■ 29-30 November 2012

International conference on LES for Internal Combustion Engine Flows

Final program

Thursday 29 November

8.30 Registration

9.15 **Welcome address by X. Montagne, adjoint scientific Director (IFPEN, France)**

9.30 **Keynote address by V. Moureau (Coria, France)**
SUCCESS: a joint initiative on LES of complex flows in realistic geometries and the promotion of super-computing

Session 1: Fundamentals

Chairman: C. Hasse (TU Freiberg, Germany)

10.10 Direct numerical simulation of engine-like geometries
M. Schmitt, C. Frouzakis, A. Tomboulides, K. Boulouchos (ETH, Switzerland)

10.35 Break

11.05 Boundary conditions and subgrid scale models for LES simulation of internal combustion engines
F. Piscaglia, A. Montorfano, A. Onorati (Politecnico di Milano, Italy)

11.30 Numerical methods and turbulence modeling for LES of piston engines: impact on flow motion and combustion
A. Misdariis[1,3], A. Robert[2,4], O. Vermorel[3], S. Richard[4], T. Poinsot[3] (1 Renault; 2 PSA Peugeot Citroën; 3 CERFACS; 4 IFPEN, France)

11.55 Using immersed boundaries for the computation of geometric variations in intake pipes
A. Bonhomme[1], A. Misdariis[2], L. Selle[1], O. Vermorel[2], A. Dauptain[2], T. Poinsot[1] (1 IMFT; 2 CERFACS, France)

12.20 Lunch

13.50 Numerical simulation of turbulent stratified flame propagation in a closed vessel
C. Gruselle, Y. D'Angelo, V. Moureau (Coria, France)

Under the auspices of the French Academy of Sciences

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Session 2: Diesel sprays

Chairman: G. Bruneaux (IFPEN, France)

14.15 Eulerian – Eulerian LES applied to transient Diesel sprays
A. Robert[1,2], L. Martinez[1], J. Tillou[1], S. Richard[1] (1 IFPEN; 2 PSA Peugeot Citroën, France)

14.40 Chemistry tabulation approach for LES of Diesel sprays
J. Tillou[1], J.B. Michel[1], C. Angelberger[1], C. Bekdemir[2], D. Veynante[3] (1 IFPEN, France; 2 Eindhoven Univ. of Technology, The Netherlands; 3 EM2C, France)

15.05 Predicting the stochastic behaviour of autoignition in Diesel-like environments with LES-CMC
Y.M. Wright[1], G. Borghesi[2], E. Mastorakos[2], K. Boulouchos[1] (1 ETH Zurich, Switzerland; 2 Univ. of Cambridge, UK)

Session 3: SIE in-cylinder flows

Chairmen: H. Pitsch (RWTH, Germany) and O. Colin (IFPEN, France)

15.30 A coupled PIV-LES approach to understanding port generated structures
M. Söder, J. Vernet, B. Lindgren, L. Fuchs (Scania/KTH, Sweden)

15.55 LES of gas exchange in IC engines
V. Mittal[1], S. Kang[2], E. Doran[3], D. Cook[3], H. Pitsch[4] (1 Stanford Univ., USA; 2 Sogong Univ., Korea; 3 Robert Bosch LLC, USA; 4 RWTH Aachen, Germany)

16.20 Break

16.50 A common engine platform for engine LES development and validation
V. Sick[1], D. Reuss[1], C. Rutland[2], D. Haworth[3], J. Oefelein[4], T-W. Kuo[5], X. Yang[5] (1 Univ. of Michigan; 2 Univ. of Wisconsin; 3 Pennsylvania State Univ.; 4 Sandia National Laboratories; 5 General Motors, USA)

17.15 LES for ICE engine flows
T-W. Kuo, X. Yang, V. Gopalakrishnan, Z. Chen (GM Global R&D, USA)

17.40 Evaluating LES and high-speed PIV with phase-invariant POD
P. Abraham[1], K. Liu[2], D. Haworth[2], D. Reuss[1], V. Sick[1] (1 Univ. of Michigan; 2 Pennsylvania State Univ., USA)

18.05 Comprehensive in-cylinder flow field measurements for LES validation
E. Baum, B. Peterson, B. Böhm, A. Dreizler (Techn. Univ. Darmstadt, Germany)

18.30 Bus departure from IFPEN to the gala cocktail

19.00 Gala cocktail at the "Château de Vert-Mont"

21.30 Bus departure from Château de Vert-Mont to Paris with a stop in Rueil-Malmaison and Nanterre (next to the hotels)

Friday 30 November

8.30 Registration

Session 4: LESSCCV: Modeling CCV in SIE

Chairmen: D. Haworth (PennState Univ., USA) and T. Unger (Porsche, Germany)

9.00 The LESSCCV EU-FP7 project
C. Angelberger (IFPEN, France)

9.15 A consistent definition of the flame displacement speed in numerical simulations of flame propagation
A. Gatzoulis[1], G. Giannakopoulos[1], M. Matalon[2], C. Altantzis[3], C. Frouzakis[3], A. Tomboulides[1] (1 Univ. of Western Macedonia, Greece; 2 Univ. of Illinois, USA; 3 ETH Zurich, Switzerland)

9.40 LES and system simulation to study CCV in a II-SIE
C. Pera[1], S. Richard[1], K. Truffin[1], C. Angelberger[1], V. Thomas[2], G. Bernard[2] (1 IFPEN; 2 LMS-Imagine, France)

10.05 Break

10.35 Coupled LES and 1D-CFD simulation of CCV in a DI-SIE
R. Tatschl[1], M. Bogensperger[1], Z. Pavlovic[1], Ch. Poetsch[1], P. Priesching[1], A. Schuemie[1], O. Vitek[2], J. Macek[2] (1 AVL, Austria; 2 TU Prague / JBRC, Czech Rep.)

11.00 Analysis of the effects of cyclic variations in a SIE by means of a quasi-dimensional combustion model
T. Cerri, G. D'Errico, A. Onorati (Politecnico di Milano, Italy)

11.25 Correlation of a zero dimensional cycle to cycle variation combustion model for SI engines
R. Norris (Ricardo, UK)

11.50 LES and 1D CFD study of CAI combustion mode and variability
P. Adomeit, J. Ewald (FEV, Germany)

12.15 Lunch

Session 5: Different aspects of ICE flows

Chairmen: C. Krüger (Daimler, Germany) and C. Rutland (UWM, USA)

13.45 Effects of inlet geometry on turbine performance
J. Fjällman, M. Mihaescu, L. Fuchs (KTH, Sweden)

14.10 Application of LES for analysis of unsteady effects on spray combustion and misfires in DISI engine
D. Goryntsev, J. Janicka (Techn. Univ. of Darmstadt, Germany)

14.35 Modeling of EGR mixing in engine intake manifolds using LES
A. Sakowitz, S. Reifarth, M. Mihaescu, L. Fuchs (KTH, Sweden)

15.00 Break

15.30 LES of exhaust flow in a heavy-duty engine
O. Bodin, Y. Wang, M. Mihaescu, L. Fuchs (KTH, Sweden)

15.55 Investigation of boundary condition effects on the analysis of cycle-to-cycle variability of a turbocharged GDI engine
S. Fontanesi[1], S. Paltrinieri[1], A. D'Adamo[1], S. Duranti[2] (1 Univ. of Modena, Italy; 2 CD-Adapco, UK)

16.20 **Closing of the conference by C. Angelberger (IFPEN, France)**