

2007 CI/CS Spring Technical Meeting – Final Program

Sunday, May 13, 2007

REGISTRATION AND RECEPTION

5:00 pm – 8:00 pm – Main Foyer

Max Bell Building

Banff Centre Campus

Monday, May 14, 2007

REGISTRATION

8:00 am – 8:30 am Max Bell Building

WELCOME

8:30 am Opening Remarks - Max Bell rm: 252

E.J. Weckman, CI/CS Chair

PLENARY SESSION 1:

8:40 am – 9:40 am Max Bell 252

Title: **Hydrogen As an Engine Fuel - Some Pros and Cons**

Speaker: **Dr. G. Karim, University of Calgary**

SESSION A: Detonations and Explosions Room: Max Bell 251 Chair: D. Nobes , University of Alberta		SESSION B: Engines I Room: Max Bell 252 Chair: D. Dale , University of Alberta
9:50 – 10:10	Title: Characterization of the Non-linear Stability of Detonation Cellular Structures Authors: M. I. Radulescu, G. J. Sharpe and J. J. Quirk	Title: An Experimental Study of Spark Anemometry for In-Cylinder Velocity Measurements Authors: D. P. Gardiner, G. Wang, M. F. Bardon, M. LaViolette and W. D. Allan
10:10 – 10:30	Title: Investigation of the Flow Field Ahead of a Flame Front in an Obstacle Laden Channel Authors: C. Johansen and G. Ciccarelli	Title: HCCI Combustion of Ethanol, Iso-Octane and Their Blend With EGR Authors: G. Gnanam, D. Haggith, A. Sobiesiak and G. Reader

10:30 am – 10:50 am

BREAK

	SESSION A: Detonations and Explosions Room: Max Bell 251 Chair: D. Nobes , University of Alberta	SESSION B: Engines I Room: Max Bell 252 Chair: D. Dale , University of Alberta
10:50 – 11:10	Title: Application of Inherent Safety Principles to Dust Explosion Prevention and Mitigation Authors: P. R. Amyotte, M. J. Pegg and F. I. Khan	Title: Cycle-to-Cycle Exhaust Temperature Monitoring for Detection of Misfiring and Combustion Instability in Reciprocating Natural Gas Engines Authors: D. P. Gardiner and M. F. Bardon
11:10 – 11:30	Title: Effect of Oxygenated Fuels on Vapor Space Flammability During Fuel System Leak Testing Authors: K. M. Frank and M. D. Checkel	Title: Experimental Study of HCCI Cyclic Variations for Low-Octane PRF Fuel Blends Authors: M. Shahbakhti, R. Lupul, A. Audet, and C. R. Koch
11:30 – 11:50	Title: Effects of Particle Size and Flammable Gas Concentration on Polyethylene Explosions Authors: N. D. Marchand and P. R. Amyotte	Title: Cycle-to-Cycle Variations of a HCCI Engine Operated with n-Heptane Authors: H. L. Li, W. S. Neill, W. Chippior and J. D. Taylor
11:50 – 12:10	Title: Numerical Simulation of the Spread of a Buoyant Fuel into Air to Examine the Evolution of the Flammable Zones Authors: S. Fardisi and G. A. Karim	Title: Combustion Timing Control of Heptane-fueled HCCI by Reformer Gas; Experiments and Chemical Kinetic Modeling Authors: V. Hosseini and M. D. Checkel

12:10 pm – 1:30 pm

LUNCH

SESSION C: Fires and Flames Room: Max Bell 251 Chair: Ö. L. Gülder , University of Toronto		SESSION D: Engines II Room: Max Bell 252 Chair: K. Bushe , University of British Columbia	
1:30 – 1:50	Title: The Effect of The Degree of Mixing on the Partially-Premixed Flame Speed Authors: J. Boulanger, F. Liu and L.-Y. Jiang	Title: Influence of Reformer Gas Replacement and its Composition on CNG- and Heptane- HCCI Combustion Using a Single Zone Combustion Model Authors: P. Kongsereparp and M. D. Checkel	
1:50 – 2:10	Title: Sensitivity Limits in Plume Transmissivity Measurements Using Sky Scattered Solar Radiation Authors: C. Yang, K. A. Thomson and M. R. Johnson	Title: Thermo-Kinetic Combustion Modeling of an HCCI Engine to Analyze Ignition Timing for Control Applications Authors: M. Shahbakhti and C. R. Koch	
2:10 – 2:30	Title: Comparison of Buoyancy-Corrected k-ε Turbulence Models on Two Helium Plumes Authors: W. Chung and C. B. Devaud	Title: Preliminary Analysis of Fuel Efficiency of Diesel HCCI Cycles Authors: Y. Tan, M. C. Mulenga, U. Asad, M. Wang, G. T. Reader and M. Zheng	
2:30 – 2:50	Title: Estimating Mass Flow Rates in Balcony Spill Plumes at High Elevations Authors: C. J. McCartney, E. J. Weckman and G. D. Loughheed	Title: Direct Injection with Partially Stratified Charge Ignition in a Natural Gas Engine Authors: D. Gorby	

2:50 pm – 3:10 pm

BREAK

SESSION C: Fires and Flames Room: Max Bell 251 Chair: Ö. L. Gülder , University of Toronto		SESSION D: Engines II Room: Max Bell 252 Chair: K. Bushe University of British Columbia	
3:10 – 3:30	Title: Prediction of Turbulent Jet Diffusion Flame Blowout Limits Using k-ε Models Authors: T. Leung and I. Wierzba	Title: Mixture Fraction Gradient Effects on Heat Release in Partially Premixed Combustion Authors: P. C. Vena, B. Deschamps, G. J. Smallwood and M. R. Johnson	
3:30 – 3:50	Title: Predicting Stability Limits of an Ultra-Lean Premixed Low Swirl Burner Authors: J. G. Strahman, R. K. Cheng and M. R. Johnson	Title: Ignition Mechanism of n-Heptane/Air Mixtures In an HCCI Combustion Engine Authors: P. Kongseereparp and M. D. Checkel	
3:50 – 4:10	Title: Stagnation Flame Experiments for Combustion Model Validation Authors: J. M. Bergthorson and P. E. Dimotakis	Title: Intake Pressure Effects on HCCI Combustion in a CFR engine Authors: V. Hosseini and M. D. Checkel	
4:10 – 4:30	Title: Inverse Diffusion Flames with Co-flowing Combustion Products Authors: M. B. Johnson and A. Sobiesiak	Title: Combustion and Performance Characteristics Analysis of HCCI Engine Fueled with Dimethyl Ether Authors: S. N. Shahangian and S. A. Jazayeri Presentation by M. Shahbakhti	

End of Formal Program for the First Day

Tuesday, May 15, 2007

PLENARY SESSION 2 Max Bell 252

8:30 am – 9:20 am

Title: **The Future for Coal Research**

Name: **Dr. I. Potter, Research Council of Alberta**

SESSION E: Diagnostics (Soot) Room: Max Bell 251 Chair: P. Amyotte , Dalhousie University		SESSION F: Fires and Flames Room: Max Bell 252 Chair: G. Ciccarelli , Queen's University	
9:30 – 9:50	Title: Soot Emissions from Turbulent Diffusion Flames Burning Simple Alkane Fuels Authors: P. M. Canteenwalla, K. A. Thomson, G. J. Smallwood, and M. R. Johnson		Title: Small and Full-Scale Fire Testing of Polyurethane Foams for Mattresses Authors: M. Hurd, D. A. Torvi, E. J. Weckman and E. K. Enniful
9:50 – 10:10	Title: Experimental Observation on the Structure and Sooting Characteristics of Laminar CH ₄ and C ₂ H ₄ Double Diffusion Flames Authors: F. Liu and G. J. Smallwood		Title: Prediction of Ignition Delay Using Conditional Moment Closure (CMC) Authors: A. EL Sayed and C. B. Devaud
10:10 – 10:30	Title: Laminar Diffusion Flames of Methane, Ethane and Propane at Elevated Pressures Authors: M. E. Vaillancourt, P. M. Mandatori, H. I. Joo and Ö. L. Gülder		Title: Effect of Precession on the Mixing of a Jet Authors: D. S. Nobes and G. J. Nathan

10:30 - 10:50 BREAK

SESSION E: Diagnostics (Soot) Room: Max Bell 251 Chair: P. Amyotte , Dalhousie University		SESSION F: Fires and Flames Room: Max Bell 252 Chair: G. Ciccarelli , Queen's University	
10:50 – 11:10	Title: Modelling of Mean Spectral Radiation Intensities in Sandia Flame D Authors: B. Jin, M. Wang and W. K. Bushe	Title: Experimental Study of Flameless Combustion in the Strong-Jet/Weak-Jet Furnace Authors: Y. He, Y. J. Lee, E. W. Grandmaison and M. D. Matovic	
11:10 – 11:30	Title: Measuring Optical Properties of Cooled Post-Flame Soot Authors: A. R. Coderre, D. R. Snelling, G. J. Smallwood and M. R. Johnson	Title: Numerical Investigation of Combustion in Catalytic Reactors Authors: S. A. Shahamiri and I. Wierzba	
11:30 – 11:50	Title: Investigation of Thermal Accommodation Using Laser Induced Incandescence Authors: K. J. Daun, G. J. Smallwood and F. Liu	Title: Laser Desorption/Laser Ionization/Time-of-Flight Mass Spectrometer for the Detection of Polycyclic Aromatic Hydrocarbons Desorbed from Soot Authors: K. Thomson, M. Ziskind, A. Faccinotto, E. Therssen, P. Desgroux and C. Focsa	
11:50 – 12:10	Title: Laser-Induced Incandescence Measurements Under Engine-Relevant Conditions Authors: M. Yeung, M. H. Davy, and S. N. Rogak	Title: Particle Emissivity and Scattering in Optically Thick Combustion Media Authors: S. Rego and M. J. Thomson	

12:10 -1:30 Lunch

SESSION G: Fires and Flames (Numerical Studies) Room: Max Bell 251 Chair: D. Torvi , University of Saskatchewan		SESSION H: Engines III Room: Max Bell 252 Chair: B. Koch , University of Alberta	
1:30 – 1:50	Title: Large Eddy Simulation of Premixed Turbulent Combustion Using a Flame Surface Density Approach Authors: W. Lin, C. P. T. Groth and Ö. L. Gülder	Title: An Experimental and Numerical Investigation of the Combustion Characteristics of a Dual Fuel Engine with a Swirl Chamber Authors: C. Liu, G. A. Karim, F. Xiao and A. Sohrabi	
1:50 – 2:10	Title: Relationships Between Flame Strains, Peak Dilatation Location and Scalar Flux Transport in Turbulent Premixed Flames Author: S. Tullis	Title: The Effect of Two Phase Injection on the Pilot Diesel Quantity in Direct Injection Natural Gas Engines Authors: B. S. Brown and S. Rogak	
2:10 – 2:30	Title: Comparison of Subfilter Scale Models for Large-Eddy Simulation of Turbulent Premixed Flames Authors: F. E. Hernandez-Perez, W. Lin, C. P. T. Groth and Ö. L. Gülder	Title: Autoignition Characteristics of Nitrogen Diluted Methane Direct Injection Compression Ignition Combustion Authors: N. Wu, W. K. Bushe and M. H. Davy	
2:30 – 2:50	Title: Development of a Parallel CFD Code for Modeling Steady Laminar Axisymmetric Non-Premixed Co-Flow Flames with Soot Authors: A. Q. Zhang, M. J. Thomson, H. Guo, F. Liu, and G. J. Smallwood	Title: Empirical Studies of Diesel Low Temperature Combustion on a Modern Diesel Engine Authors: X. Han, U. Asad, R. Kumar, M. C. Mulenga, S. Banerjee, M. Wang, G. T. Reader and M. Zheng	

2:50 pm – 3:10 pm

BREAK

SESSION G: Fires and Flames Room: Max Bell 251 Chair: D. Torvi , University of Saskatchewan		SESSION H: Engines III Room: Max Bell 252 Chair: B. Koch , University of Alberta	
3:10 – 3:30	Title: Chemical Structures of an n-Butanol Counterflow Flame Authors: S. M. Sarathy and M. J. Thomson	Title: Glow Plug Discretized Model for Direct Injection Natural Gas Diesel Engine Authors: S. Xu Cheng and J. S. Wallace	
3:30 – 3:50	Title: Effect of Reformate Gas Enrichment on Temperature and NO Formation in Strained CH ₄ /Air Diffusion Flames Authors: H. Guo, S. W. Neill and G. J. Smallwood	Title: Flowbench Validation of a Numerical Model for a Novel Uniflow-Scavenged Two-Stroke GDI Engine Authors: P. Oliver and G. Ciccarelli	
3:50 – 4:10	Title: The Thermal Environment in a Wind-Blown Fire Plume Authors: C. S. Lam and E. J. Weckman	Title: Combustion Characteristics of BioDiesel Droplets Authors: A. Lam and A. Sobiesiak	

CI/CS ANNUAL BUSINESS MEETING
4:15 pm – 4:45 pm Room: Max Ball 252

BANQUET

6:30 pm – 10:00 pm Main Dining Room, Banff Centre

Wednesday, May 16, 2007

PLENARY SESSION 3
8:30 am – 9:20 am Max Bell 252

Title: **Laser Ignition for S.I. Engines: Then and Now**

Name: **Dr. D. Dale, University of Alberta**

SESSION I: Efficient Use of Energy Room: Max Bell 252 Chair: M. R. Johnson , Carleton University	
9:30 – 9:50	Title: A Particle-Resolved Model for Packed Bed Combustion of Solid Fuels Authors: A. Tuck and W. Hallett
9:50 – 10:10	Title: CALMOB6: A Predictive Emissions and Fuel Consumption Tool for Transportation Analysis Authors: R. Busawon, M. D. Checkel, A. Brownlee, L. Doblanko and C. Hardin
10:10 – 10:30	Title: Performance Study of a Stirling Engine in a Combined Heat and Power System Authors: A. Aliabadi, M. Thomson, J. Wallace and T. Tzanetakis

10:30 am – 10:50 am **BREAK**

SESSION I: Efficient Use of Energy Room: Max Bell 252 Chair: M. R. Johnson , Carleton University	
10:50 – 11:10	Title: Field Testing Residential Fan-Assisted Gas Fired Furnaces: Effects of Altitude on Safe Operation Limits, Current De-rating Standards, Efficiency and Emissions Authors: B. A. Fleck, S. C. Arnold, M.Y. Ackerman, J. D. Dale, W. E. Klaczek and D. J. Wilson

End of Conference – Closing Remarks