

# **10th US Combustion Meeting 2017**

College Park, Maryland, USA  
23 - 24 April 2017

Volume 1 of 4

ISBN: 978-1-5108-4238-0

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2017) by The Combustion Institute  
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact The Combustion Institute  
at the address below.

The Combustion Institute  
5001 Baum Boulevard  
Suite 644  
Pittsburgh, PA 15213-1851  
USA

Phone: (412) 687-1366  
Fax: (412) 687-0340

[Office@CombustionInstitute.org](mailto:Office@CombustionInstitute.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

## VOLUME 1

### PLENARY LECTURE

<b>OPPORTUNITIES AND CHALLENGES FOR COMBUSTION RESEARCH</b> .....	1
<i>J. Lighty</i>	

### CHEMICAL KINETICS I

<b>1A01: HIGH ACCURACY THERMOCHEMICAL KINETICS FOR <math>H + CH_3 (+M) \leftrightarrow CH_4 (+M)</math></b> .....	2
<i>N.J. Labbe, A.W. Jasper, J.A. Miller, S.J. Klippenstein, B. Ruscic, R. Sivarama-krishnan</i>	
<b>1A02: QUANTUM CHEMICAL AND KINETIC MODELLING OF METHYL-VINYL+O<sub>2</sub> REACTION</b> .....	8
<i>X. Chen, C.F. Goldsmith</i>	
<b>1A03: INFERENCE OF H<sub>2</sub>O<sub>2</sub> THERMAL DECOMPOSITION RATE PARAMETERS FROM EXPERIMENTAL STATISTICS</b> .....	15
<i>T.A. Casey, M. Khalil, H. Najm</i>	
<b>1A04: CRITERIA OF FILTERING THE BEST SET OF KINETIC PARAMETERS FROM THE LITERATURE DATABASE</b> .....	21
<i>M. Ferreira Martins, F.H. Sepúlveda Palma</i>	

### CHEMICAL KINETICS II

<b>1A05: HONO DECOMPOSITION KINETICS</b> .....	27
<i>C.F. Goldsmith</i>	
<b>1A06: AUTOMATED TRANSITION STATE THEORY CALCULATIONS OF ABSTRACTION REACTIONS BY HYDROPEROXYL, COMPARED TO LITERATURE MODEL VALUES</b> .....	33
<i>N. Harms, B. Slakman, J. Cain, R.H. West</i>	
<b>1A07: IMPORTANCE OF PERICYCLIC REACTIONS FOR BIOMASS PYROLYSIS AND COMBUSTION</b> .....	39
<i>P.R. Westmoreland, A. Bose, C.J. McGill</i>	
<b>1A08: REACTION MECHANISMS OF R AND QOOH RADICALS PRODUCED IN LOW-TEMPERATURE OXIDATION OF BUTANONE</b> .....	45
<i>R.L. Caravan, B. Rotavera, E. Papajak, I.O. Antonov, K. Ramasesha, J. Zádor, D.L. Osborn, C.A. Taatjes</i>	
<b>1A09: AN UPDATED COMPREHENSIVE CHEMICAL KINETIC MODEL OF C<sub>8</sub>-C<sub>20</sub> N-ALKANES</b> .....	51
<i>G. Kukkadapu, S.W. Wagnon, M. Mehl, K. Zhang, C.K. Westbrook, W.J. Pitz, M.J. Mcnenly, S.M. Sarathy, A. Rodriguez, O. Herbinet, F. Battin-Leclerc, C.-J. Sung</i>	

### CHEMICAL KINETICS III

<b>1A10: KINETIC STUDY OF LOW TEMPERATURE OXIDATION OF N-PENTANE WITH NITRIC OXIDE ADDITION IN A JET STIRRED REACTOR</b> .....	61
<i>H. Zhao, L. Wu, C. Patrick, Z. Zhang, Y. Rezgüi, G. Wysocki, Y. Ju</i>	
<b>1A11: EFFECT OF STEREOISOMERIC STRUCTURE AND BOND LOCATION ON THE IGNITION AND REACTION PATHWAYS OF HEXENES</b> .....	67
<i>C. Liu, C.L. Barraza-Botet, S.W. Wagnon, M.S. Wooldridge</i>	
<b>1A12: MECHANISTIC ANALYSIS OF N-PROPYLCYCLO-HEXANE AND N-BUTYLCYCLO-HEXANE OXIDATION IN LOW TEMPERATURE REGIME</b> .....	73
<i>J.A. Corrubia, N.P. Cernansky, D.L. Miller</i>	
<b>1A13: AUTOIGNITION OF TRANS-DECALIN, A DIESEL SURROGATE COMPOUND: RAPID COMPRESSION MACHINE EXPERIMENTS AND CHEMICAL KINETIC MODELING</b> .....	80
<i>M. Wang, G. Kukkadapu, K. Zhang, W.J. Pitz, C.-J. Sung</i>	
<b>1A14: NEW AND REALISTIC PATHWAYS FROM CYCLOPENTA-DIENE (CPD) TO NAPHTHALENE, PHENANTHRENE, AND OTHER SOOT PRECURSORS</b> .....	94
<i>A.E. Long, C.A. Grambow, A.G. Vandeputte, S.S. Merchant, W.H. Green</i>	

### CHEMICAL KINETICS IV

<b>1A15: ATOMISTIC SCALE INVESTIGATION OF PAH CURVATURE EFFECTS ON SOOT OXIDATION</b> .....	100
<i>A. Jain, A.C.T. Van Duin</i>	
<b>1A16: COMPUTATIONS OF PHYSICAL AND ELECTRONIC STRUCTURE OF STACKS OF POLYNUCLEAR AROMATIC HYDROCARBONS OF VARYING TOPOLOGIES</b> .....	106
<i>J.A. Giaccai, E.M. Adkins, J.H. Miller</i>	

<b>1A17: A COMPREHENSIVE DETAILED KINETIC MECHANISM FOR THE SIMULATION OF TRANSPORTATION FUELS</b> .....	112
<i>M. Mehl, K. Zhang, S. Wagnon, G. Kukkadapu, C.K. Westbrook, W.J. Pitz, Y. Zhang, H. Curran, M. Al Rachidi, N. Atef, S.M. Sarathy</i>	
<b>1A18: THE DEVELOPMENT AND VALIDATION OF A CHEMICAL KINETIC MODEL FOR ANISOLE, A COMPOUND TO REPRESENT BIOMASS PYROLYSIS FUELS</b> .....	118
<i>S.W. Wagnon, S. Thion, E.J.K. Nilsson, M. Mehl, Z. Serinyel, K. Zhang, P. Dagaut, A.A. Konnov, G. Dayma, W.J. Pitz</i>	
<b>1A19: EXPERIMENTAL AND KINETIC MODELING STUDY OF TRANS-METHYL 2-OCTENOATE OXIDATION USING REACTION RATE RULES FROM ALKANES</b> .....	124
<i>K. Zhang, C. Togbé, P. Dagaut, W. Pitz, S. Wagnon</i>	
<b>1A20: MULTIDIMENSIONAL NUMERICAL INVESTIGATION OF NOX FORMATION IN A BURNER COUPLED FLOW TUBE CONFIGURATION: NOX KINETICS IN POST, PRE AND FLAME LOCATIONS</b> .....	136
<i>S.F. Ahmed, A. Dasgupta, F.L. Dryer, T.I. Farouk</i>	

## **FIRE I**

<b>1B01: THE THERMAL STRUCTURE OF THE BLUE WHIRL USING DIFFERENT LIQUID FUELS</b> .....	143
<i>S.B. Hariharan, P.M. Anderson, Y. Hu, H. Xiao, M.J. Gollner, E.S. Oran</i>	
<b>1B02: BURNING BEHAVIOR OF A POOL FIRE ON A WATER LAYER WITH A THIN METAL WOOL</b> .....	149
<i>H. Sezer, K.S. Arsava, A.S. Rangwala</i>	
<b>1B03: LARGE-SCALE WIND-TUNNEL EXPERIMENTS AND NUMERICAL STUDY ON MOVING-TYPE FIRE WHIRLS</b> .....	155
<i>K. Kuwana, T. Suzaki, K. Sekimoto, Y. Nakamura, K. Saito</i>	
<b>1B04: THERMAL AND FLOW STRUCTURES OF A POROUS BURNER FLAME AND AN ARRAY OF MICRO FLAME BURNERS: IMPLICATIONS TO SIMULATE LARGE SCALE MASS FIRES AND FIRE WHIRLS IN LABORATORY</b> .....	161
<i>A.A. Salameh, T. Hirasawa, M. Fuchihata, N. Akafuah, K. Saito</i>	

## **FIRE II**

<b>1B05: LARGE-SCALE DIESEL POOL FIRE MODELING</b> .....	167
<i>C. Cao, M. Corn, V. Sankaran</i>	
<b>1B06: A MODEL FOR FIRE-WHIRL MOVEMENT ALONG FIRE LINES</b> .....	173
<i>K. Kuwana, K. Saito, F.A. Williams</i>	
<b>1B07: NUMERICAL DESCRIPTION OF FIRE-WHIRL DYNAMICS OVER LIQUID FUEL POOLS</b> .....	179
<i>W. Coenen, D. Moreno-Boza, A.L. Sánchez, F.A. Williams</i>	
<b>1B08: AN EXPERIMENTAL STUDY OF THE FLAME INTERMITTENT FREQUENCIES OF WIND-DRIVEN LINE FIRES</b> .....	185
<i>W. Tang, M. Finney, S. McAllister, M. Gollner</i>	
<b>1B09: MEASURED AND SIMULATED TEMPERATURE STATISTICS IN A BUOYANCY-DRIVEN TURBULENT LINE FIRE</b> .....	191
<i>S. Verma, J. White, E. Keller, A. Marshall, P. Sunderland, A. Trouvé</i>	

## **FIRE III**

<b>1B10: MODELING THERMAL RUNAWAY IN LITHIUM-ION PACKS AS A FUNCTION OF SCALE AND HEAT SOURCE</b> .....	197
<i>R.C. Shurtz, J.C. Hewson</i>	
<b>1B11: A FORMULATION FOR THE MECHANISMS OF FLASHOVER IN SPREADING ROOM FIRES</b> .....	203
<i>J.G. Quintiere</i>	
<b>1B12: COMPARISON OF THERMAL DECOMPOSITION MODELS IN CHAPARRAL FUELS</b> .....	209
<i>D.R. Weise, W.E. Mell, X. Zhou, S. Mahalingam</i>	
<b>1B13: MODELING POROUS PMDI-BASED POLYURETHANE FOAM DECOMPOSITION IN PRESSURIZING SYSTEMS</b> .....	215
<i>S.N. Scott, R.M. Keedy, V.E. Brunini, A.B. Dodd</i>	
<b>1B14: RADIATION CHARACTERISTICS OF FIRE-INSPIRED HETEROGENEOUS MIXTURES: A MONTE CARLO RAY TRACING STUDY</b> .....	221
<i>B. Wu, X. Zhao</i>	

## **FIRE IV**

<b>1B15: THERMOGRAVI-METRIC ANALYSIS AND MODELING OF NOMEX FABRIC PYROLYSIS</b> .....	227
<i>Y. Li, Y.-T.T. Liao</i>	
<b>1B16: NUMERICAL STUDY OF PYROLYSIS AND COMBUSTION OF A CARBON FIBER-EPOXY COMPOSITE</b> .....	233
<i>H. Koo, A.L. Brown, T. Voskuilen, F. Pierce</i>	

<b>1B17: PYROLYSIS AND BURNING OF LEAF-LIKE FUEL BY CONVECTIVE HEATING: A COMPUTATIONAL STUDY</b> .....	239
<i>B. Shotorban, B. Yashwanth, S. Mahalingam, D.J. Haring, P.R. Borujerdi</i>	
<b>1B18: NUMERICAL INVESTIGATION OF FIRE DYNAMICS IN THE PRESENCE OF BURNING OBSTACLES UNDER A UNIDIRECTIONAL WIND</b> .....	245
<i>S.P. Kozhumal, G. Di Cristina, N.S. Skowronski, A. Simeoni, S.-K. Im, A.S. Rangwala</i>	
<b>1B19: LARGE EDDY SIMULATIONS OF A TURBULENT WALL FIRE AND A TURBULENT LINE BURNER USING FIREFOAM</b> .....	251
<i>A. Marchand, S. Verma, H. Li, A. Trouvé</i>	
<b>1B20: CHARACTERIZATION OF SLOPED CEILING JET FLOW USING LASER-ASSISTED SALTWATER MODELING TECHNIQUE</b> .....	257
<i>P.M.F. Maisto, A.W. Marshall, M.J. Gollner</i>	

## SUPPRESSION/PROTECTION I

<b>1C01: STRUCTURE AND THERMAL CHARACTERIZATION OF EXPANDED INTUMESCENT COATINGS FOR FIRE PROTECTION</b> .....	263
<i>J. Kang, F. Takahashi, J.S. T'ien</i>	
<b>1C02: FLAME SPREAD OVER A FIRE RESISTANT FABRIC UNDER EXTERNAL HEATING</b> .....	269
<i>M. Thomsen, X. Huang, A. Alonso, C. Fernandez-Pello, D.L. Urban, G.A. Ruff</i>	
<b>1C03: CHARACTERIZATION OF THERMAL DEGRADATION BEHAVIOR FOR POLYMERS CONTAINING REACTIVE FLAME RETARDANTS: APPLICATION TO GLASS FIBER REINFORCED POLYAMIDE 66 BLENDED WITH RED PHOSPHOROUS</b> .....	275
<i>Y. Ding, S.I. Stoliarov, R.H. Kraemer</i>	
<b>1C04: KINETICS EFFECT ON CARBON MONOXIDE YIELD IN BURNING OF POLYMERIC SOLIDS CONTAINING FLAME RETARDANTS</b> .....	281
<i>H. Guo, R.E. Lyon, N. Safronava, R.N. Walters, S. Crowley</i>	

## SUPPRESSION/PROTECTION II

<b>1C05: MODELS FOR ABSORPTION AND SCATTERING OF RADIATION BY WATER DROPLETS IN FIRE SUPPRESSION ENVIRONMENTS</b> .....	287
<i>A. Gupta, K.V. Meredith, Y. Wang, M. Chaos</i>	
<b>1C06: FIREFIGHTING NOZZLE REACTION AND HOSE TENSION</b> .....	293
<i>S.K. Chin, G. Jomaas, P.B. Sunderland</i>	
<b>1C07: AN ANALYTICAL FRAMEWORK FOR FIRE SPRINKLER PLUME PENETRATION</b> .....	299
<i>E. Link, H. Baum, A. Marshall</i>	
<b>1C08: MECHANISMS FOR FIRE SUPPRESSION WITH AQUEOUS FOAMS AND THE ROLE OF SURFACTANTS</b> .....	305
<i>R. Ananth, K. Hinnant</i>	
<b>1C09: DEVELOPMENT OF AN ANALYTICAL AFFF FORMULATION FOR THE EVALUATION OF ALTERNATIVE SURFACTANTS</b> .....	311
<i>K. Hinnant, A. Snow, J. Farley, S. Giles, R. Ananth</i>	

## DROPLETS/SPRAY I

<b>1C10: BOUNCING TO MERGING TRANSITION IN DROP IMPACT ON LIQUID FILM: ROLE OF VISCOSITY</b> .....	317
<i>X. Tang, A. Saha, C.K. Law, C. Sun</i>	
<b>1C11: DROP BOUNCING ON LIQUID FILM: EVOLUTION OF GAS LAYER</b> .....	323
<i>X. Tang, A. Saha, C.K. Law, C. Sun</i>	
<b>1C12: SIMULATION OF DROP IMPACT ON A HOT WALL USING SPH METHOD WITH PENG-ROBINSON EQUATION OF STATE</b> .....	329
<i>M. Ray, X. Yang, S.-C. Kong</i>	
<b>1C13: SECONDARY BREAKUP OF LIQUID DROPS IN AN ACCELERATING FLOW AT HIGH WEBER NUMBERS</b> .....	335
<i>N. Ciarlini, M. Gamba</i>	
<b>1C14: FUEL VAPOR CLOUD FORMATION DURING AND AFTER LOW TEMPERATURE DROPLET BURNING IN MICROGRAVITY</b> .....	341
<i>D.L. Dietrich, V. Nayagam, F.A. Williams</i>	

## DROPLETS/SPRAY II

<b>1C15: COMPREHENSIVE STUDY OF THE INITIAL DIAMETER FOR COMBUSTION OF N-HEPTANE/ ISO-OCTANE MIXTURE DROPLETS</b> .....	347
<i>Y. Xu, T. Farouk, Y. Shen, M.C. Hicks, C.T. Avedisian, Y. Xie, A.P. Reeves, F.L. Dryer</i>	

<b>1C16: EXTINCTION CHARACTERISTICS OF ISOLATE N-ALKANE FUEL DROPLETS DURING LOW TEMPERATURE COOL FLAME BURNING</b> .....	354
<i>T.I. Farouk, F.L. Dryer</i>	
<b>1C17: COOL FLAME COMBUSTION OF SUB-MILLIMETER SIZED HIGHER N-ALKANE DROPLETS AT ATMOSPHERIC CONDITION</b> .....	360
<i>F.E. Alam, F.L. Dryer, T.I. Farouk</i>	
<b>1C18: DISTILLATION-RESOLVED EVOLUTION OF KEY COMBUSTION PROPERTIES</b> .....	366
<i>J.A. Lefkowitz, F.M. Haas</i>	
<b>1C19: A UNIFAC-BASED APPROACH TO GASOLINE DROPLET EVAPORATION AND THE ROLE OF OXYGENATES ON PM PRECURSOR VAPORIZATION</b> .....	372
<i>S. Burke, M. Ratcliff, R. McCormick, R. Rhoads, B. Windom</i>	
<b>1C20: SUBGRID MIXING AND EVAPORATION MODELING IN LARGE EDDY SIMULATION OF TWO-PHASE REACTING FLOWS</b> .....	378
<i>A. Panchal, R. Ranjan, S. Menon</i>	

## **TURBULENT FLAMES I**

<b>1D01: THEORETICAL AND NUMERICAL ANALYSIS OF OSCILLATORY DIFFUSION FLAMES</b> .....	384
<i>M. Miklavcic, I.S. Wichman</i>	
<b>1D02: INTERMITTENCY IN TURBULENT PREMIXED HYDROGEN-AIR FLAMES</b> .....	390
<i>S. Whitman, A.Y. Poludnenko, P.E. Hamlington</i>	
<b>1D03: ANALYTICAL STUDY ON NEAR-FIELD ENTRAINMENT IN A TRANSIENT TURBULENT FREE JET</b> .....	396
<i>M.E. Feyz, R. Nalim, J.P. Gore, A. Tarraf</i>	
<b>1D04: A JET-STIRRED CHAMBER FOR COMBUSTION IN HOMOGENEOUS, ISOTROPIC, NEAR-ZERO MEAN FLOW TURBULENCE</b> .....	402
<i>A.A. Davani, P.D. Ronney</i>	

## **COAL CHEMISTRY**

<b>1D05: PREDICTING THE CONVERSION EFFICIENCIES OF ANY COAL TYPE IN CFBCS</b> .....	408
<i>S. Niksa, Y. Sakurai, N. Fujiwara</i>	
<b>1D06: MODELING SOOT IN COAL SYSTEMS</b> .....	414
<i>A.J. Josephson, T.H. Fletcher, D.O. Lignell</i>	
<b>1D07: FORMATION OF ACID GASES FROM CO-FIRING OF COAL WITH RAW AND TORREFIED BIOMASSES</b> .....	420
<i>E. Rokni, A. Panahi, Y.A. Levendis</i>	
<b>1D08: REDUCING POLLUTANT EMISSIONS IN A WOOD BURNING, NATURAL DRAFT COOKSTOVE USING LAB-BASED FIRE POWER SWEEP MEASUREMENTS</b> .....	426
<i>G. Allawatt, D. Udensen, A. Pundle, B. Sullivan, C. Garland, M. Johnson, P. Means, J. Kramlich, J.D. Posner</i>	
<b>1D09: IGNITION OF A DISPERSED COAL PARTICLE STREAM AND MEASUREMENT OF ULTRAFINE PARTICLE SIZE DISTRIBUTIONS</b> .....	432
<i>A. Adeosun, Q. Huang, T. Li, X. Wang, A. Gopan, Z. Yang, S. Li, R.L. Axelbaum</i>	

## **COMPUTATIONAL ANALYSIS I**

<b>1D10: UNCERTAINTY OF A FOUNDATIONAL FUEL CHEMISTRY MODEL</b> .....	439
<i>Y. Tao, G.P. Smith, H. Wang</i>	
<b>1D11: CHEMKED: A HUMAN- AND MACHINE-READABLE DATA STANDARD FOR CHEMICAL KINETICS EXPERIMENTS</b> .....	445
<i>B.W. Weber, K.E. Niemeyer</i>	
<b>1D12: ANALYSIS OF THE ERRORS ASSOCIATED WITH MOLECULAR TRANSPORT PARAMETERS IN COMBUSTION MODELING AND THEIR EFFECTS ON ONE-DIMENSIONAL FLAME SIMULATIONS</b> .....	458
<i>D.I. Pineda, X. Shi, T.A. Casey, J.-Y. Chen</i>	
<b>1D13: EVALUATING MULTI-COMPONENT PRESSURE DEPENDENCE OF MIXTURE RULES FOR MULTI-CELL MULTI-CHANNEL REACTING SYSTEMS</b> .....	464
<i>L. Lei, M.P. Burke</i>	
<b>1D14: AUTOMATED DISCOVERY OF NON-BOLTZMANN BIMOLECULAR PATHWAYS IN NO<sub>x</sub> FORMATION</b> .....	470
<i>M. Barbet, K. McCullough, M.P. Burke</i>	

## **COMPUTATIONAL ANALYSIS II**

<b>1D15: A MIDPOINT-RULE-BASED EXTRAPOLATION SOLVER FOR COMBUSTION CFD</b> .....	476
<i>A. Imren, D.C. Haworth</i>	

<b>1D16: MODELING STUDY OF THE ANTI-KNOCK TENDENCY OF SUBSTITUTED PHENOLS AS ADDITIVES</b> .....	482
<i>N.W. Yee, P. Zhang, S. Filip, C. Hetrick, B. Yang, W.H. Green</i>	
<b>1D17: LOW-ORDER DISCRETE DYNAMICAL SYSTEM FOR JET DIFFUSION FLAME</b> .....	488
<i>W. Zeng, J.M. McDonough</i>	
<b>1D18: MODELING OF PLASMA ASSISTED COMBUSTION IN ALKALI-DOPED METHANE FLAMES</b> .....	494
<i>J.E. Lynch, T.R. Sippel</i>	
<b>1D19: A QUANTUM MECHANICS STUDY ON EARLY DECOMPOSITION REACTIONS FOR LIQUID-PHASE HMX</b> .....	500
<i>L. Patidar, M. Khichar, S.T. Thynell</i>	
<b>1D20: COMPUTATIONAL ANALYSIS OF RDX THERMOLYSIS IN LIQUID STATE</b> .....	506
<i>M. Khichar, L. Patidar, S.T. Thynell</i>	

## **HETEROGENEOUS COMBUSTION I**

<b>1E01: IGNITION OF B4C AND B CONTAINING SOLID RAMJET FUEL</b> .....	512
<i>J. Kalman, T. Hedman, E. Tolmachoff, T. Tran</i>	
<b>1E02: ENHANCEMENT OF HTPB COMBUSTION IN A HYBRID ROCKET MOTOR USING AMORPHOUS TI-AL-B NANOPOWDER ADDITIVES</b> .....	518
<i>T.L. Connell Jr., Z.J. Huba, A. Epshteyn, R.A. Yetter, B.T. Fisher</i>	
<b>1E03: TEMPERATURE SENSITIVITY AND HIGH-PRESSURE CHARACTERISTICS OF NANO-SIZED ADDITIVES IN AP/HTPB-COMPOSITE PROPELLANTS</b> .....	524
<i>C.A.M. Dillier, A.R. Demko, J.M. Stahl, T. Sammet, E.L. Petersen</i>	
<b>1E04: ASSEMBLY AND ENCAPSULATION OF ALUMINUM NP'S WITHIN AP/NC MATRIX AND THEIR REACTIVE PROPERTIES</b> .....	530
<i>H. Wang, R.J. Jacob, J.B. DeLisio, M.R. Zachariah</i>	

## **HETEROGENEOUS COMBUSTION II**

<b>1E05: COMBUSTION BEHAVIOR OF SURFACE FUNCTIONALIZED ALUMINUM NANOPARTICLE DISPERSIONS IN KEROSENE</b> .....	536
<i>M.N. Bello, D.K. Smith, M. Pantoya</i>	
<b>1E06: COMBUSTION CHARACTERISTICS OF HYDROCARBON DROPLETS INDUCED BY PHOTOIGNITION OF ALUMINUM NANOPARTICLES</b> .....	542
<i>A. Badakhshan, J.W. Bennewitz, D.G. Talley</i>	
<b>1E07: INVESTIGATING THE REACTION MECHANISM OF AL/PVDF FILMS AT 1 ATM</b> .....	548
<i>M.C. Rehwoldt, J.B. DeLisio, H. Wang, M.R. Zachariah</i>	
<b>1E08: IGNITION AND COMBUSTION CHARACTERISTICS OF AL/RDX/NC NANOSTRUCTURED MICROPARTICLES</b> .....	554
<i>G. Young, D.P. Wilson, J.B. DeLisio, M.R. Zachariah</i>	
<b>1E09: EFFECT OF MILLING TEMPERATURE ON STRUCTURE AND REACTIVITY OF AL-NI COMPOSITES</b> .....	560
<i>O.S. Lagoviyer, M. Schoenitz, E.L. Dreizin</i>	

## **COAL COMBUSTION MODELING**

<b>1E10: LARGE EDDY SIMULATION OF DYNAMIC ASH DEPOSITION IN A PULVERIZED COAL BOILER</b> .....	566
<i>M. Zhou, B. Isaac, S.T. Smith, J.N. Thornock, P.J. Smith</i>	
<b>1E11: DEVELOPMENT OF A NEURAL NETWORK MODEL FOR PREDICTION OF METHANE NUMBER OF PRODUCER GAS MIXTURES</b> .....	573
<i>D. Wise, R. Seiser, R. Cattolica, D.B. Olsen</i>	
<b>1E12: PREDICTING THE PERFORMANCE OF A NATURAL DRAFT COOKSTOVE FOR THE DEVELOPING WORLD USING COMPUTATIONAL FLUID DYNAMICS</b> .....	579
<i>A. Pundle, B. Sullivan, G. Allawatt, J. Kramlich, J. Posner</i>	
<b>1E13: COUPLING AN EXPLICIT LOW-MACH PROJECTION SCHEME TO VARIOUS CHEMISTRY MODELS AND INTERPHASE SOURCE TERMS</b> .....	585
<i>J. McConnell, T. Saad, J.C. Sutherland</i>	
<b>1E14: VALIDATION AND UNCERTAINTY QUANTIFICATION ANALYSIS (VUQ) OF A CHAR OXIDATION MODEL</b> .....	594
<i>O. Díaz-Ibarra, J. Spinti, P. Smith, C. Shaddix, E. Hecht</i>	

## **BIOMASS COMBUSTION**

<b>1E15: EFFECT OF WATER-LEACHING ON THE FINE PARTICLE FORMATION DURING BIOMASS COMBUSTION</b> .....	600
<i>X. Wang, A. Adeosun, Z. Hu, T. Li, H. Tan, R.L. Axelbaum</i>	

<b>1E16: BIOMASS GASIFICATION STUDY APPLIED TO BIOMASS INTEGRATED GASIFICATION COMBINED CYCLE</b> .....	606
<i>G. Zang, S. Tejasvi, A. Ratner</i>	
<b>1E17: PREDICTING FAST PYROLYSIS OF BIOMASS PARTICLES WITH DIFFERENT GEOMETRIES</b> .....	612
<i>Y. Pan, S.-C. Kong</i>	
<b>1E18: TORREFIED BIOMASS SIZE FOR COMBUSTION IN EXISTING BOILERS</b> .....	618
<i>A. Panahi, M. Tarakcioglu, Y.A. Levendis</i>	
<b>1E19: PSEUDO-COMPONENTS OF HEMICELLULOSE AND LIGNIN FOR THE KINETIC MODELLING OF BIOMASS PYROLYSIS</b> .....	624
<i>K. Dussan, S. Dooley, R.F.D. Monaghan</i>	
<b>1E20: SPONTANEOUS IGNITION OF HYDROTHERMAL FLAMES IN SUPERCRITICAL ETHANOL/WATER SOLUTIONS</b> .....	630
<i>M.C. Hicks, U.G. Hegde, J.J. Kojima</i>	

## **IC ENGINE CHEMISTRY I**

<b>1F01: OBSERVATIONS OF SOOT OPTICAL PROPERTY CHARACTERISTICS USING HIGH-SPEED, MULTIPLE WAVELENGTH, EXTINCTION IMAGING IN HEAVY-DUTY DIESEL SPRAYS</b> .....	636
<i>K. Yasutomi, S.A. Skeen</i>	
<b>1F02: SOOT AND SPECTRAL RADIATION MODELING FOR A HIGH-PRESSURE TURBULENT SPRAY FLAME</b> .....	643
<i>S. Ferreyro Fernandez, C. Paul, A. Sircar, A. Imren, D.C. Haworth, S. Roy, M.F. Modest</i>	
<b>1F03: REDUCING THE EMISSIONS AND EFFICIENCY PENALTIES OF LOW TEMPERATURE COMBUSTION (LTC) THROUGH LOW HEAT REJECTION (LHR)</b> .....	649
<i>T. Kroeger, T. Jacobs</i>	
<b>1F04: ROLE OF TURBULENCE-CHEMISTRY INTERACTIONS AT LOW TEMPERATURE ENGINE CONDITIONS</b> .....	655
<i>P. Kundu, M. Ameen, S. Som</i>	

## **MICRO-COMBUSTION/NEW CONCEPTS I**

<b>1F05: EFFECTS OF NON-EQUILIBRIUM PLASMA DISCHARGE ON IGNITION AND LTC OF DME/O<sub>2</sub>/AR MIXTURES: A NUMERICAL INVESTIGATION</b> .....	661
<i>Y. Zhang, S. Yang, W. Sun, V. Yang</i>	
<b>1F06: PLASMA-ASSISTED COMBUSTION IN SPRAY FLAMES AT ELEVATED TEMPERATURES AND PRESSURES</b> .....	667
<i>F.G. del Campo, D.E. Weibel, C. Wen, F. Takahashi</i>	
<b>1F07: REDUCTION OF FLAME DEVELOPMENT TIME USING NANOSECOND-PULSED HIGH-FREQUENCY DISCHARGES IN FLOWING MIXTURES</b> .....	673
<i>J.K. Lefkowitz, T. Ombrello</i>	
<b>1F08: LOW TEMPERATURE KINETICS OF PENTANE OXIDATION IN A NANOSECOND-PULSED PLASMA DISCHARGE</b> .....	679
<i>A. Rousso, X. Mao, Y. Ju</i>	
<b>1F09: IGNITION AND FLAME PROPAGATION ENHANCEMENT BY DUAL-PULSED LASER-INDUCED BREAKDOWN</b> .....	685
<i>L. Wermer, J.K. Lefkowitz, T. Ombrello, S.-K. Im</i>	

## **MICRO-COMBUSTION/NEW CONCEPTS II**

<b>1F10: EXPLORING THE MECHANISMS OF SPONTANEOUS COMBUSTION OF H<sub>2</sub>/O<sub>2</sub> IN NANOBUBBLES GENERATED BY WATER ELECTROLYSIS</b> .....	691
<i>S. Jain, L. Qiao</i>	
<b>1F11: FLAME PROPAGATION THROUGH CONVERGING-DIVERGING (C-D) MICROCHANNELS</b> .....	703
<i>S. Biswas, L. Qiao</i>	
<b>1F12: RICH-BURN, QUICK-MIX, LEAN-BURN COMBUSTOR WITH FLAME-ASSISTED FUEL CELLS</b> .....	717
<i>R.J. Milcarek, M.J. Garrett, J. Ahn</i>	
<b>1F13: BIOGAS COMBUSTION CHARACTERIZATION FOR FLAME FUEL CELL UTILIZATION</b> .....	723
<i>M.J. Garrett, R. Falkenstein-Smith, R.J. Milcarek, J. Ahn</i>	
<b>1F14: MICRO-COMBUSTION OF GASEOUS FUELS IN THE FREI REGIME</b> .....	729
<i>I. Schoegl, P. Sharma, M.J. McNenly</i>	

## **IC ENGINE MODELING**

<b>1F15: A NUMERICAL INVESTIGATION OF CO FORMATION AND CONSUMPTION PATHWAY IN A DIESEL ENGINE</b> .....	735
<i>Y. Li, H. Li, H. Guo</i>	



<b>1F16: LARGE EDDY SIMULATION OF DIMETHYL ETHER (DME) REACTING SPRAY FLAME IN COMPRESSION IGNITION (CI) ENGINE-RELEVANT CONDITIONS</b> .....	741
<i>A.A. Moiz, K.D. Cung, L. Zhao, M.M. Ameen, S. Som, S.-Y. Lee</i>	
<b>1F17: MODELING RADIATIVE HEAT TRANSFER AND TURBULENCE-RADIATION INTERACTIONS IN ENGINES</b> .....	747
<i>C. Paul, A. Sircar, S. Ferreyro-Fernandez, A. Imren, D.C. Haworth, S. Roy, W. Ge, M.F. Modest</i>	
<b>1F18: AN ASSESSMENT OF CFD-BASED WALL HEAT TRANSFER MODELS IN PISTON ENGINES</b> .....	753
<i>A. Sircar, C. Paul, S. Ferreyro-Fernandez, A. Imren, D.C. Haworth</i>	
<b>1F19: MULTI-CYCLE LARGE EDDY SIMULATION TO CAPTURE CYCLE-TO-CYCLE VARIATION (CCV) IN SPARK-IGNITED (SI) ENGINES</b> .....	759
<i>L. Zhao, A.A. Moiz, S. Som, N. Fogla, M. Bybee, S. Wahiduzzaman, M. Mirzaeian, F. Millo, J. Kodavasal</i>	
<b>1F20: DYNAMIC ADAPTIVE COMBUSTION MODELING OF DIESEL SPRAY FLAMES BASED ON CHEMICAL EXPLOSIVE MODE ANALYSIS</b> .....	765
<i>C. Xu, M.M. Ameen, S. Som, J.H. Chen, T. Lu</i>	

## **EXTINCTION AND IGNITION I**

<b>1G01: STUDY OF AUTO-IGNITION AND EXTINCTION CHARACTERISTICS OF DIESEL BLENDED WITH OXYGENATES IN LAMINAR OPPOSED NON-PREMIXED FLAMES</b> .....	771
<i>R. Khare, K. Narayana-swamy, V. Raghavan</i>	
<b>1G02: THE EFFECT OF RESIDENCE TIME ON THE IGNITABILITY OF ETHYLENE AND AIR MIXTURES IN A TOROIDAL JET-STIRRED REACTOR</b> .....	777
<i>R.D. Stachler, J.K. Lefkowitz, T.M. Ombrello, S.D. Stouffer, J.S. Heyne, J.D. Miller</i>	
<b>1G03: COMPUTATIONAL STUDY OF LASER IGNITION OF PREMIXED FUEL AIR MIXTURES IN A RAPID COMPRESSION MACHINE</b> .....	788
<i>S. Bhoite, C. Dumitrache, A. Yalin, A.J. Marchese</i>	

## **VOLUME 2**

<b>1G04: MULTI-MODAL COUNTERFLOW FLAME STRUCTURE UNDER AUTOIGNITIVE CONDITIONS</b> .....	794
<i>T. Grenga, M.E. Mueller</i>	

## **EXTINCTION AND IGNITION II**

<b>1G05: CHEMICAL EXPLOSIVE MODE ANALYSIS ON EXTINCTION OF 1-D PREMIXED COUNTERFLOW FLAMES</b> .....	800
<i>J.-W. Park, T. Lu</i>	
<b>1G06: FLAME QUENCHING DYNAMICS IN A RECTANGULAR CROSS SECTION CHANNEL FOR DIFFERENT VELOCITY REGIMES</b> .....	808
<i>A.M. Mahuthannan, D.A. Lacoste, J. Damazo, E. Kwon, W.L. Roberts</i>	
<b>1G07: QUENCHING, IGNITION, FLAME PROPAGATION, AND EXTINCTION IN HOT-SPOTS AT ELEVATED TEMPERATURE AND PRESSURE</b> .....	814
<i>J. Santner, S.S. Goldsborough</i>	
<b>1G08: EXPERIMENTAL INVESTIGATION OF LAMINAR PREMIXED METHANE-AIR FLAME EXTINCTION WITH SAND AND SODIUM BICARBONATE PARTICLES</b> .....	820
<i>S. Ranganathan, D. Petrow, S. Rockwell, A.S. Rangwala</i>	
<b>1G09: THE INFLUENCE OF STOICHIOMETRIC MIXTURE FRACTION ON EXTINCTION OF LAMINAR, NONPREMIXED DME FLAME</b> .....	826
<i>M. Hunyadi-Gall, G. Mairinger, R. Khare, K. Narayana-swamy, V. Raghavan, K. Seshadri</i>	

## **LAMINAR FLAMES I**

<b>1G10: FUEL WALL FILM EFFECTS ON PREMIXED FLAME PROPAGATION, QUENCHING AND EMISSION</b> .....	831
<i>H. Ge, P. Zhao</i>	
<b>1G11: ACOUSTIC SUPPRESSION OF ALKANE FUELED LINE-FLAMES</b> .....	838
<i>A.N. Friedman, S.I. Stolarov</i>	
<b>1G12: EXTRACTING LENGTH SCALES OF A THERMO-DIFFUSIVELY UNSTABLE LAMINAR FLAME</b> .....	844
<i>J. Schlup, G. Blanquart</i>	
<b>1G13: STRUCTURE OF NONPREMIXED SWIRL-TYPE TUBULAR FLAMES BURNING CONDENSED FUELS WITH UNITY LEWIS NUMBERS</b> .....	851
<i>V.M. Sauer, F.F. Fachini, D. Dunn-Rankin</i>	
<b>1G14: DYNAMICS OF PULSATING PLANAR PREMIXED FLAMES</b> .....	857
<i>J. Graña-Otero, A. Liñán</i>	

## LAMINAR FLAME PROPAGATION I

<b>1G15: UNSTEADY DEFLAGRATION SPEED IN AN AUTO-IGNITIVE DME/AIR MIXTURE AT NTC CONDITIONS</b> .....	863
<i>S. Desai, R. Sankaran, H.G. Im</i>	
<b>1G16: EFFECT OF HIGHER HYDROCARBON CONTENT ON LAMINAR BURNING VELOCITY AND FLAME STABILITY OF NATURAL GAS</b> .....	869
<i>A.R.Khan, M.R.Ravi, A. Ray</i>	
<b>1G17: PREDICTING REAL TRANSPORTATION FUEL COMBUSTION PROPERTIES: DISTINCT CHEMICAL FUNCTIONALITIES IN HYDROCARBON LAMINAR BURNING VELOCITIES</b> .....	875
<i>K. Dussan, F.L. Dryer, S.H. Won, S. Dooley</i>	
<b>1G18: UNCERTAINTY REDUCTION IN LAMINAR FLAME SPEED EXTRAPOLATION FROM EXPANDING SPHERICAL FLAMES</b> .....	881
<i>J. Huo, S. Yang, Z. Ren, C.K. Law</i>	
<b>1G19: LAMINAR FLAME SPEEDS OF DILUTE SARIN SIMULANTS IN H<sub>2</sub>-CH<sub>4</sub>-AIR MIXTURES</b> .....	887
<i>T. Sikes, N. Niemiec, W. Kulatilaka, E.L. Petersen</i>	
<b>1G20: LAMINAR FLAME SPEEDS OF LEAN H<sub>2</sub>/O<sub>2</sub>/HE AT LOW AND ELEVATED PRESSURES</b> .....	893
<i>W. Zhang, X. Gou, Z. Chen</i>	

## PDF MODELS

<b>1H01: VARIANCE CONSISTENT MEAN SHIFT PARTICLE MODEL FOR TREATING DIFFERENTIAL MOLECULAR DIFFUSION IN TRANSPORTED PDF METHODS FOR TURBULENT REACTIVE FLOWS</b> .....	899
<i>P. Zhang, H. Wang</i>	
<b>1H02: JOINT SCALAR PROBABILITY DENSITY FUNCTION MODELING FOR MULTISCALAR TURBULENT MIXING</b> .....	911
<i>B.A. Perry, M.E. Mueller</i>	
<b>1H03: A CO-LOCATED PARTICLE METHOD FOR TRANSPORTED PDF SIMULATIONS OF COAL FLAMES</b> .....	917
<i>J. Cai</i>	
<b>1H04: PROPAGATION OF KINETIC UNCERTAINTY THROUGH SURROGATE SUBSPACE IN COMBUSTION SIMULATIONS</b> .....	923
<i>W. Ji, J. Wang, B. Yang, Z. Ren, C.K. Law</i>	

## TURBULENT FLAME MODELS I

<b>1H05: COMPARATIVE ANALYSIS OF METHODS FOR HEAT LOSSES IN PHYSICALLY-DERIVED REDUCED-ORDER MANIFOLDS</b> .....	929
<i>A. C. Nunno, T. Grenga, M.E. Mueller</i>	
<b>1H06: DEPENDENCY OF TURBULENT SPRAY COMBUSTION MODELING ON MESH RESOLUTION USING FLAMELET GENERATED MANIFOLDS</b> .....	935
<i>A. Goyal, O.S. Abianeh, L. Bravo</i>	
<b>1H07: PHYSICALLY-DERIVED REDUCED-ORDER MANIFOLDS FOR MULTI-MODAL TURBULENT COMBUSTION</b> .....	941
<i>M.E. Mueller</i>	
<b>1H08: EFFECT OF NUMERICAL APPROACHES FOR FLAMELET TABLE INTEGRATION ON FLAMELET MODELING OF A TURBULENT JET FLAME AND A SELF-EXCITED RESONANCE COMBUSTOR</b> .....	947
<i>C. Han, T. Pant, H. Wang</i>	
<b>1H09: MODELING EFFECTIVE LEWIS NUMBERS IN NON-PREMIXED FLAMES: INSIGHTS FROM DNS DATA OF SANDIA FLAME B</b> .....	964
<i>B.N. Burali, G. Blanquart</i>	

## TURBULENT FLAME MODELS II

<b>1H10: CFD MODELING OF A HOMOGENY-EOUSLY CHARGED TURBULENT JET IGNITION SYSTEM USING LARGE EDDY SIMULATIONS</b> .....	971
<i>M. Gholamisheeri, E. Toulson</i>	
<b>1H11: ON THE COMPARISON OF FINITE-RATE KINETICS AND FLAMELET BASED SUBGRID MODELS FOR LES OF TURBULENT PREMIXED FLAME</b> .....	977
<i>M. Rieth, R. Ranjan, S. Menon, A. Kempf</i>	
<b>1H12: HIGH-FIDELITY SIMULATION OF COMBUSTION PROCESSES IN LIQUID ROCKET ENGINES</b> .....	983
<i>X. Wang, V. Yang</i>	
<b>1H13: ACCOUNTING FOR REAL GAS EFFECTS IN CFD SIMULATIONS OF HIGH DENSITY COMBUSTION</b> .....	989
<i>C. Zheng, D. Coombs, B. Akih-Kumgeh</i>	

<b>1H14: HIERARCHICAL MODEL FORM UNCERTAINTY QUANTIFICATION FOR TURBULENT COMBUSTION MODELING</b> .....	996
<i>M.E. Mueller</i>	

### **TURBULENT FLAME PROPAGATION**

<b>1H15: EFFECT OF STOICHIOMETRIC MIXTURE FRACTION ON HYDROGEN EDGE-FLAMES IN A COUNTER-FLOW BURNER</b> .....	1002
<i>Z. Zhou, P.D. Ronney</i>	
<b>1H16: TURBULENT FLAME SPEEDS AT HIGH PRESSURES: EFFECTS OF FLAMEFRONT INSTABILITY</b> .....	1008
<i>S. Yang, A. Saha, C.K. Law</i>	
<b>1H17: EFFECT OF SODIUM BICARBONATE ON THE BURNING VELOCITY OF PREMIXED TURBULENT IRON-METHANE AIR FLAMES</b> .....	1014
<i>S.R. Rockwell, J. Taveau, D. Petrow</i>	
<b>1H18: PREMIXED SYNGAS FLAME PROPAGATION IN AN ENCLOSED CONSTANT VOLUME CHAMBER</b> .....	1020
<i>Y.M. Najim, N. Müller, I.S. Wichman</i>	
<b>1H19: LIFT-OFF OF NON-PREMIXED TURBULENT CH<sub>4</sub> JET FLAMES AT ELEVATED PRESSURES</b> .....	1028
<i>T.F. Guiberti, W.R. Boyette, A.M. Elbaz, A.R. Masri, W.L. Roberts</i>	
<b>1H20: TURBULENT FLAME SPEED MEASUREMENTS OF MULTI-COMPONENT FUELS</b> .....	1034
<i>H. Johnson II, D. Dasgupta, A. Steinbrenner, D. Wu, D. Noble, T. Asai, T. Lieuwen</i>	

### **DIAGNOSTICS I**

<b>1J01: CHARACTERIZATION OF A JET ABOVE A CATALYTIC COMBUSTOR USING WAVELENGTH MODULATION SPECTROSCOPY</b> .....	1043
<i>T.R.S. Hayden, C. LaPointe, N.T. Wimer, J.D. Christopher, P.E. Hamlington, G.B. Rieker</i>	
<b>1J02: A NEW DIAGNOSTIC FOR HYDROCARBON FUELS USING 3.41-<math>\mu</math>M DIODE LASER ABSORPTION</b> .....	1049
<i>S. Wang, T. Parise, D.F. Davidson, R.K. Hanson</i>	
<b>1J03: A BAYESIAN PROCESSING MODEL FOR HIGH SPEED, TRANSIENT ENGINE EXHAUST CHARACTERIZATION</b> .....	1055
<i>D. Wilson, C. Allen</i>	
<b>1J04: MEASUREMENTS OF LOW CONCENTRATION HYDROCARBONS AT ELEVATED TEMPERATURES AND PRESSURES USING SUPERCONTINUUM LASER ABSORPTION SPECTROSCOPY</b> .....	1061
<i>M. Halloran, N. Traina, T. Lee, J. Yoo</i>	

### **DIAGNOSTIC II**

<b>1J05: SHOCK TUBE STUDY OF JET FUEL PYROLYSIS AND IGNITION AT ELEVATED PRESSURE</b> .....	1067
<i>J. Shao, Y. Zhu, S. Wang, D.F. Davidson, R.K. Hanson</i>	
<b>1J06: FTIR ABSORPTION CROSS SECTION MEASUREMENTS OF ORGANO PHOSPHORUS COMPOUNDS</b> .....	1073
<i>S. Neupane, C.E. Bishop, R. Peale, S. Vasu</i>	
<b>1J07: HYPERSPECTRAL IMAGING DIAGNOSTICS OF A LAMINAR HYDROGEN FLAME</b> .....	1078
<i>M.R. Rhoby, K.C. Gross</i>	
<b>1J08: FOURIER TRANSFORM MICROWAVE SPECTROSCOPIC STUDIES OF DIMETHYL ETHER AND ETHYLENE FLAMES</b> .....	1084
<i>N. Hansen, J. Wullenkord, D.A. Obenchain, K. Kohse-Höinghaus, J.-U. Grabow</i>	
<b>1J09: COMBINED LASER ABSORPTION AND GAS CHROMATO-GRAPHY (GC) SPECIATION IN A SHOCK TUBE: VALIDATION AND APPLICATION TO ETHYLENE PYROLYSIS</b> .....	1090
<i>A.M. Ferris, D.F. Davidson, R.K. Hanson</i>	

### **SOOT DIAGNOSTICS**

<b>1J10: ESTIMATING SOOT PRIMARY PARTICLE DIAMETER USING TIME-RESOLVED LASER-INDUCED INCANDESCENCE</b> .....	1096
<i>J.P. Abrahamson, M. Singh, R.L. Vander Wal</i>	
<b>1J11: REPEATABILITY AND REPRODUCIBILITY OF SEMI-AUTOMATED MEASUREMENTS OF SOOT PRIMARY PARTICLE SIZE DISTRIBUTIONS FROM TEM IMAGES</b> .....	1106
<i>P.M. Anderson, H. Guo, P.B. Sunderland</i>	
<b>1J12: EXTINCTION MEASUREMENTS NEAR 3.0 MICROMETERS IN NITROGEN DILUTE, ETHYLENE, NON-PREMIXED FLAMES</b> .....	1112
<i>R.S. Jacobson, D.M. Bailey, E.M. Adkins, J.H. Miller</i>	
<b>1J13: CHEMICAL COMPOSITION OF CARBON INKSTICKS REVEALED THROUGH RAMAN SPECTROSCOPY</b> .....	1118
<i>J.A. Giaccai, J.H. Miller</i>	

<b>1J14: DUAL-PUMP COHERENT ANTI-STOKES RAMAN SCATTERING MEASUREMENTS IN SOOTING ETHYLENE DIFFUSION FLAMES STABILIZED ON A YALE BURNER.....</b>	<b>1124</b>
<i>A. Satija, A. Lowe, L. Thomas, A.R. Masri, R.P. Lucht</i>	

### **DIAGNOSTICS III**

<b>1J15: MEASUREMENT OF CARBON MONOXIDE (CO) IN SOOTING FLAMES USING FEMTOSECOND TWO-PHOTON LASER-INDUCED FLUORESCENCE (FS-TPLIF).....</b>	<b>1130</b>
<i>Y. Wang, W. Kulatilaka</i>	
<b>1J16: HIGH-RESOLUTION OH AND CH<sub>2</sub>O VISUALIZATION IN A PREMIXED CAVITY-ANCHORED ETHYLENE-AIR FLAME IN A M = 0.6 FLOWFIELD.....</b>	<b>1136</b>
<i>C.M. Geipel, R.D. Rockwell, H.K. Chelliah, A.D. Cutler, C.A. Spelker, Z. Hashem, P.M. Danehy</i>	
<b>1J17: HIGH PRESSURE EFFECTS ON PLIF OF A NONPREMIXED COFLOW FLAME.....</b>	<b>1142</b>
<i>D. Escofet-Martin, Y.-C. Chien, D. Dunn-Rankin</i>	
<b>1J18: A SIMPLIFIED APPROACH TO MULTI-SCALAR IMAGING FOR TURBULENT PREMIXED FLAMES.....</b>	<b>1148</b>
<i>A.W. Skiba, C.D. Carter, S.D. Hammack, T. Lee</i>	
<b>1J19: FLAME STRUCTURE AND CHEMILUMINESCENCE IN PREMIXED FLAMES.....</b>	<b>1154</b>
<i>J. Graña-Otero, S. Mahmoudi</i>	
<b>1J20: CONTINUOUS WAVE CEMOR FOR MEASUREMENT OF HO<sub>2</sub>.....</b>	<b>1160</b>
<i>M. Stichter, N. Cernansky, D. Miller</i>	

### **SOOT IN LAMINAR FLAMES I**

<b>1K01: EFFECT OF AROMATIC FUELS ON AROMATIC SPECIES AND SOOT DISTRIBUTIONS IN LAMINAR, CO-FLOW, NON-PREMIXED FLAMES AT ATMOSPHERIC PRESSURE.....</b>	<b>1168</b>
<i>A. Makwana, S. Iyer, M. Linevsky, R. Santoro, T. Litzinger, J. O'Connor</i>	
<b>1K02: DETAILED MODELLING OF CO<sub>2</sub> ADDITION EFFECTS ON THE EVOLUTION OF SOOT PARTICLE SIZE DISTRIBUTION FUNCTIONS IN PREMIXED LAMINAR ETHYLENE FLAMES.....</b>	<b>1179</b>
<i>A. Naseri, A. Veshkini, M.J. Thomson</i>	
<b>1K03: ELECTRONIC PROPERTIES OF POLYCYCLIC AROMATIC HYDROCARBONS AND THEIR DERIVATIVES.....</b>	<b>1185</b>
<i>D. Chen, H. Wang</i>	
<b>1K04: FLAME TEMPERATURE EFFECT ON THE TRANSITION BETWEEN SOOT AND GRAPHITIC CARBON PRODUCTS IN PREMIXED STAGNATION FLAMES.....</b>	<b>1191</b>
<i>J. Bonpua, J. Camacho</i>	

### **STATIONARY COMBUSTION SYSTEMS**

<b>1K05: A MODELING TOOL FOR HOUSEHOLD BIOGAS BURNER FLAME PORT DESIGN.....</b>	<b>1197</b>
<i>T. Decker, M. Baumgardner, T. Bradley, J. Prapas</i>	
<b>1K06: THE EFFECTS OF INERT-PLACEMENT (Z<sub>ST</sub>) ON SOOT AND RADIATIVE HEAT FLUX IN TURBULENT DIFFUSION FLAMES.....</b>	<b>1203</b>
<i>A. Gopan, Z. Yang, B.M. Kumfer, R.L. Axelbaum</i>	
<b>1K07: LASER-OPTICAL INVESTIGATION OF HIGHLY RADIATIVE, HIGH TEMPERATURE HOMOGENEOUS COMBUSTION.....</b>	<b>1209</b>
<i>K. Aanjaneya, W. Cao, Y. Chen, A. Atreya</i>	
<b>1K08: KW SCALE COMBUSTOR FOR POWER GENERATION.....</b>	<b>1216</b>
<i>A. Frank, P. Therkelsen, J.-Y. Chen, R.K. Cheng</i>	
<b>1K09: A STUDY OF RADIATIVE FLAMELESS COMBUSTION IN A FURNACE.....</b>	<b>1222</b>
<i>A. Atreya, H.R. Baum</i>	

### **DETONATION I**

<b>1K10: SIMULATIONS OF THE LINEAR MODEL DETONATION ENGINE.....</b>	<b>1228</b>
<i>D. Schwer, K. Kailasanath, J. Burr, K. Yu</i>	
<b>1K11: DETAILED COMPARISON OF HIGH-ORDER AND LOW-ORDER METHODS FOR SIMULATING DDT IN OBSTACLE-LADEN CHANNELS.....</b>	<b>1234</b>
<i>H. Xiao, V.N. Gamezo, R.W. Houim, C.R. Kaplan, E.S. Oran</i>	
<b>1K12: OPTIMIZATION OF CHEMICAL-DIFFUSIVE MODELS FOR DEFLAGRATION-TO-DETONATION TRANSITION CALCULATIONS.....</b>	<b>1240</b>
<i>C. Kaplan, W. Zheng, H. Xiao, R. Houim, E. Oran</i>	
<b>1K13: ROLE OF LOW-TEMPERATURE CHEMISTRY IN DETONATION OF N-HEPTANE/OXYGEN/DILUENT MIXTURES.....</b>	<b>1246</b>
<i>W. Liang, R. Mével, C.K. Law</i>	

<b>1K14: MAGNETIC RECONNECTION DETONATION IN SUPERNOVA REMNANTS</b> .....	1252
<i>H. Zhang, Y. Gao, C.K. Law</i>	

## **DETONATION II**

<b>1K15: INVESTIGATION OF FLAME ACCELERATION IN GASEOUS AND LIQUID FUELS IN THE SANDIA/PURDUE 20 FT. COMBUSTION TUBE FACILITY</b> .....	1258
<i>T.J. Graziano, P.B. Venkatesh, S.P.M. Bane, S.E. Meyer, M.C. Grubelich</i>	
<b>1K16: EXPERIMENTS IN THE LINEAR MODEL DETONATION ENGINE</b> .....	1264
<i>J.R. Burr, K.H. Yu, D. Schwer, K. Kailasanath</i>	
<b>1K17: EXPERIMENTAL AND NUMERICAL STUDY OF FLAME ACCELERATION AND TRANSITION TO DETONATION IN NARROW CHANNELS</b> .....	1270
<i>J. Melguizo-Gavilanes, R. Houim</i>	
<b>1K18: PHYSICS AND FLAME STRUCTURE OF A STAGED TRANSVERSE JET AND PULSED DETONATION IN SUPERSONIC CROSSFLOW</b> .....	1276
<i>Y.M. Abul-Huda, M. Gamba</i>	
<b>1K19: FLAME ACCELERATION AND DDT IN ETHYLENE/NITROUS OXIDE AT ELEVATED PRESSURES</b> .....	1282
<i>P. B. Venkatesh, T.J. Graziano, S.P.M. Bane, S.E. Meyer, M.C. Grubelich</i>	
<b>1K20: EFFECT OF COMBUSTION PRODUCTS ON DETONATION VELOCITIES</b> .....	1288
<i>D.R. Bean, M.F. Zaiger, R. Nelke, P. Beck, I. Walters, D.L. Blunck</i>	

## **PLENARY LECTURE**

<b>ADVANCES VARIATIONAL TRANSITION STATE THEORY FOR COMBUSTION REACTIONS</b> .....	1296
<i>D. Truhlar</i>	

## **CHEMICAL KINETICS V**

<b>2A01: A NEW JET-STIRRED REACTOR FOR CHEMICAL KINETICS INVESTIGATIONS</b> .....	1297
<i>A.A. Davani, P.D. Ronney</i>	
<b>2A02: INVESTIGATION OF PRESSURE MEASUREMENTS IN A HIGH-PRESSURE SHOCK TUBE</b> .....	1303
<i>M. Karimi, S. Carpenter, D. Ranjan, W. Sun</i>	
<b>2A03: LASER ABSORPTION MEASUREMENTS OF ETHYLENE AND CARBON MONOXIDE TIME-HISTORIES DURING N-HEPTANE OXIDATION AT LOW TEMPERATURES BEHIND REFLECTED SHOCK WAVES</b> .....	1309
<i>A.M. Tulgestke, D.F. Davidson, R.K. Hanson</i>	
<b>2A04: END WALL IMAGING OF CO<sub>2</sub> DILUTED CH<sub>4</sub>/O<sub>2</sub>/AR IGNITION INSIDE A SHOCK TUBE</b> .....	1315
<i>O. Pryor, S. Barak, E. Ninnemann, S. Vasu</i>	

## **CHEMICAL KINETICS VI**

<b>2A05: SHOCK-TUBE MEASUREMENTS BY LASER ABSORPTION OF CO AND H<sub>2</sub>O TIME-HISTORIES FROM NITROMETHANE PYROLYSIS</b> .....	1321
<i>O. Mathieu, C. Mulvihill, E.L. Petersen</i>	
<b>2A06: A SHOCK TUBE LASER SCHLIEREN STUDY OF PHENYL CHLORIDE PYROLYSIS</b> .....	1327
<i>J. Lockhart, P.T. Lynch, C.J. Annesley, A.M. Mebel, S.J. Klippenstein, R.S. Tranter</i>	
<b>2A07: A SHOCK TUBE LASER SCHLIEREN STUDY OF 1-PENTENE PYROLYSIS</b> .....	1333
<i>J.B. Randazzo, C.J. Annesley, R.S. Tranter</i>	
<b>2A08: THERMAL PYROLYSIS OF N-DODECANE IN THE PRESENCE OF VITAIATES</b> .....	1339
<i>K. Dang, G. Simms, H. Chelliah</i>	
<b>2A09: AB INITIO INVESTIGATION OF THE NITROSATION REACTIONS OF HYDROXYLAMINE IN AQUEOUS SOLUTIONS</b> .....	1345
<i>K. Zhang, S.T. Thynell</i>	

## **CHEMICAL KINETICS VII**

<b>2A10: EVIDENCE SUPPORTING A SIMPLIFIED APPROACH TO MODELING HIGH-TEMPERATURE COMBUSTION CHEMISTRY</b> .....	1351
<i>R. Xu, H. Wang, D.F. Davidson, R.K. Hanson, C.T. Bowman, F.N. Egoropoulos</i>	
<b>2A11: HYCHEM MODEL: APPLICATION TO PETROLEUM-DERIVED JET FUELS</b> .....	1357
<i>R. Xu, D. Chen, K. Wang, Y. Tao, J.K. Shao, T. Parise, Y. Zhu, S. Wang, R. Zhao, D.J. Lee, F.N. Egoropoulos, D.F. Davidson, R.K. Hanson, C.T. Bowman, H. Wang</i>	
<b>2A12: SENSITIVITY TO EXPERIMENTAL UNCERTAINTY IN SURROGATE DESCRIPTIONS OF AVIATION FUELS</b> .....	1363
<i>P.B. Govindaraju, M. Ihme</i>	
<b>2A13: REDUCED HYCHEM MODELS FOR JET FUEL COMBUSTION</b> .....	1372
<i>Y. Gao, T. Lu</i>	

<b>2A14: FUEL STRUCTURE EFFECTS ON SURROGATE ALTERNATIVE JET FUEL COMBUSTION</b> .....	1382
<i>G. Flora, J.P. Cain, M.S.P. Kahandawala, S.S. Sidhu</i>	

### **CHEMICAL KINETICS VIII**

<b>2A15: COMBUSTION KINETICS OF CONVENTIONAL AND ALTERNATIVE JET FUELS USING A HYBRID CHEMISTRY (HYCHEM) APPROACH</b> .....	1390
<i>K. Wang, R. Xu, T. Parise, J.K. Shao, D.J. Lee, A. Movaghar, D.F. Davidson, R.K. Hanson, H. Wang, C.T. Bowman, F.N. Eglafopoulos</i>	
<b>2A16: EVALUATION OF A HYBRID CHEMISTRY APPROACH FOR COMBUSTION OF BLENDED PETROLEUM AND BIO-DERIVED JET FUELS</b> .....	1396
<i>K. Wang, R. Xu, T. Parise, J.K. Shao, D.F. Davidson, R.K. Hanson, H. Wang, C.T. Bowman</i>	
<b>2A17: SHOCK-TUBE STUDIES OF SARIN SURROGATES</b> .....	1402
<i>O. Mathieu, W.D. Kulatilaka, E.L. Petersen</i>	
<b>2A18: META-MODELS FOR IGNITION DELAY TIMES WITH APPLICATIONS TO SURROGATE FUEL MIXTURE GENERATION</b> .....	1408
<i>R.A. Whitesides, M.J. McNenly</i>	
<b>2A19: A REDUCED CHEMISTRY MODEL FOR MULTIPLE GASOLINE-ETHANOL SURROGATES BY A JACOBIAN-AIDED DRGEP APPROACH</b> .....	1414
<i>Y. Chen, M. Mehl, J.-Y. Chen</i>	

### **FIRE V**

<b>2B01: LOW PRESSURE FLAME BLOWOFF FROM THE FORWARD STAGNATION REGION OF A BLUNT-NOSED CAST PMMA CYLINDER IN AXIAL MIXED CONVECTIVE FLOW</b> .....	1421
<i>J. W. Marcum, P. Rachow, P. V. Ferkul, S.L. Olson</i>	
<b>2B02: THE SAFFIRE EXPERIMENT: LARGE-SCALE COMBUSTION ABOARD SPACECRAFT</b> .....	1427
<i>P. Ferkul, D.L. Urban, S. Olson, G.A. Ruff, J. Easton, J.S. T'ien, Y.-T.T. Liao, A.C. Fernandez-Pello, J.L. Torero, G. Legros, C. Eigenbrod, N. Smirnov, O. Fujita, S. Rouvreau, B. Toth, G. Jomaas</i>	
<b>2B03: EMULATION OF CONDENSED FUEL FLAMES USING A BURNING RATE EMULATOR (BRE) IN MICROGRAVITY</b> .....	1433
<i>A. Markan, J.G. Quintiere, P.B. Sunderland, J. L. de Ris, D. P. Stocker</i>	
<b>2B04: TIME-RESOLVED ANALYSIS OF THERMAL FAILURE OF PRISMATIC LITHIUM ION BATTERIES</b> .....	1439
<i>A.O. Saïd, X. Liu, Z. Wu, C. Lee, S.I. Stolarov</i>	

### **FIRE VI**

<b>2B05: IGNITION KINETICS OF COMBUSTIBLE SOLIDS</b> .....	1445
<i>R.E. Lyon, N. Safronava, S. Crowley</i>	
<b>2B06: INVESTIGATION OF MERGING FLAMES IN HORIZONTAL AND VERTICAL GEOMETRIES</b> .....	1451
<i>M. Rhamati, M.-S. Safdari, E. Amini, T.H. Fletcher</i>	
<b>2B07: MEASUREMENT OF GAS TEMPERATURES IN BUOYANT TURBULENT DIFFUSION FLAMES UNDER AIR AND REDUCED-OXYGEN ENVIRONMENTS</b> .....	1457
<i>G. Agarwal, D. Zeng, Y. Wang</i>	
<b>2B08: MASS-LOSS MEASUREMENTS ON SOLID MATERIALS AFTER PULSED RADIANT HEATING AT HIGH HEAT FLUX</b> .....	1463
<i>J.D. Engerer, A.L. Brown, J.M. Christian</i>	
<b>2B09: MOISTURE CONTENT EFFECTS ON ENERGY AND EMISSIONS RELEASED DURING THE COMBUSTION OF PYROPHYTIC VEGETATION FROM VARIOUS REGIONAL ECOSYSTEMS</b> .....	1469
<i>N.A. May, E. Ellicott, M.J. Gollner</i>	

### **FIRE VII**

<b>2B10: INVESTIGATING STREAK-LIKE STRUCTURES IN BOUNDARY LAYER COMBUSTION VIA HEATED PLATES</b> .....	1475
<i>C. Miller, M. Finney, S. McAllister, T. Grunstrup, E. Sluder, W. Tang, M. Gollner</i>	
<b>2B11: ENHANCED IGNITION POTENTIAL OF OXIDIZING IRON SPARKS</b> .....	1481
<i>J.L. Urban, D.C. Murphy, C. Fernandez-Pello</i>	
<b>2B12: QUANTIFYING GAS-PHASE IGNITION PROCESSES DURING THE AUTOIGNITION OF WOOD</b> .....	1487
<i>S. McAllister</i>	
<b>2B13: SEMI-EMPIRICAL MODEL FOR FIRE SPREAD IN CHAMISE AND BIG SAGEBRUSH SHRUBS WITH SPATIALLY-DEFINED FUEL ELEMENTS AND FLAMES</b> .....	1493
<i>C. Shen, D.R. Prince, J. Gallacher, M.E. Fletcher, T.H. Fletcher</i>	
<b>2B14: ANALYSIS OF PYROLYSIS PRODUCTS FROM LIVE SHRUB FUELS</b> .....	1499
<i>M.-S. Safdari, M. Rahmati, E. Amini, T.H. Fletcher</i>	

## **FIRE VIII**

<b>2B15: FLAME SCALING IN LABORATORY FIRES SPREADING WITH WIND AND SLOPE</b> .....	1504
<i>M.A. Finney, J.D. Forthofer, T. Grumstrup</i>	
<b>2B16: QUALITATIVE FLOW VISUALIZATION OF FLAME ATTACHMENT ON SLOPES</b> .....	1510
<i>T.P. Grumstrup, S.S. McAllister, M.A. Finney</i>	
<b>2B17: EXPERIMENTAL STUDY OF ANAEROBIC PYROLYSIS OF POLY(VINYL CHLORIDE)</b> .....	1516
<i>J.D. Swann, Y. Ding, S.I. Stolarov</i>	
<b>2B18: SENSITIVITY OF SMOLDERING COMBUSTION TO CELLULOSE AND HEMICELLULOSE CONTENT</b> .....	1522
<i>D.A. Cowan, B.D. Smucker, D.L. Blunck</i>	
<b>2B19: DEVELOPMENT OF A MOBILE MEDIUM SCALE DISPERSED DUST FLAME EFFECTS TESTING APPARATUS</b> .....	1530
<i>S.R. Rockwell, D. Petrow, C. Hanks, E. Curran</i>	

## **NORBERT PETERS MEMORIAL SESSION I**

<b>2C01: WHAT CAUSES HYDROCARBON AUTOIGNITION? AN ONGOING DEBATE</b> .....	1536
<i>C.K. Westbrook</i>	
<b>2C02: THE IMPACT OF THERMAL DIFFUSION ON THE STRUCTURE OF NON-PREMIXED LAMINAR FLAMES</b> .....	1542
<i>A. Scholtissek, F. Hunger, F. Dietzsch, C. Hasse</i>	
<b>2C03: CONSTRAINED-TEMPERATURE SOLUTIONS OF COFLOW LAMINAR DIFFUSION FLAMES</b> .....	1548
<i>N.J. Kempema, R.R. Dobbins, M.B. Long, M.D. Smooke</i>	
<b>2C04: A THEORETICAL ANALYSIS OF THE FIRST-STAGE IGNITION DELAY IN HYDROCARBON OXIDATION CHEMISTRY</b> .....	1554
<i>C.K. Law, W. Liang</i>	

## **NORBERT PETERS MEMORIAL SESSION II**

<b>2C05: RECENT ADVANCES IN UNDERSTANDING QUASI-STEADY DROPLET COMBUSTION SUPPORTED BY COOL-FLAME CHEMISTRY</b> .....	1560
<i>F.A. Williams, D.L. Dietrich, V. Nayagam</i>	
<b>2C06: THE ROLE OF COOL-FLAME DYNAMICS IN HIGH-PRESSURE SPRAY IGNITION</b> .....	1566
<i>R.N. Dahms, G.A. Paczko, S.A. Skeen, L.M. Pickett</i>	
<b>2C07: TURBULENT PREMIXED FLAMES - HYDRODYNAMIC THEORY</b> .....	1572
<i>M. Matalon</i>	
<b>2C08: A CONCENTRIC FLOW SLOT BURNER FOR TURBULENT FLAMES OF PARTIALLY PREMIXED AND INHOMOGENEOUS MIXTURES OF GASEOUS FUELS</b> .....	1575
<i>M. Mansour, A. Masri, H. Pitsch, S. Kruse, M. Zayed, M. Senousi, M. Juddoo</i>	
<b>2C09: RATE-RATIO ASYMPTOTIC ANALYSIS OF THE INFLUENCE OF ADDITION OF CARBON MONOXIDE ON THE STRUCTURE AND MECHANISMS OF EXTINCTION OF NONPREMIXED METHANE FLAMES</b> .....	1581
<i>K. Seshadri, X.-S. Bai</i>	

## **VOLUME 3**

### **FLAME SPREAD I**

<b>2C10: AN EXPERIMENTAL STUDY OF UPWARD FLAME SPREAD OVER WAVY THIN SOLIDS</b> .....	1587
<i>J.S. T'ien, J. Jordan, Z. Wu, G. Nastac</i>	
<b>2C11: DOWNWARD AND UPWARD SPREAD OF SMOLDERING PEAT FIRE</b> .....	1595
<i>X. Huang, G. Rein</i>	
<b>2C12: EXPERIMENTAL STUDY OF VERTICAL UPWARD FLAME SPREAD AND DRIPPING BEHAVIOR OVER POLYSTYRENE FOAMS AT DIFFERENT ALTITUDES</b> .....	1601
<i>X. Huang, G. Chen, W. Liu, J. Sun, M.J. Gollner</i>	
<b>2C13: FLAME SPREAD AND DRIPPING BEHAVIORS IN HORIZONTAL AND VERTICAL WIRES</b> .....	1607
<i>Y. Kobayashi, X. Huang, Y. Konno, S. Nakaya, M. Tsue, N. Hashimoto, O. Fujita, C. Fernandez-Pello</i>	
<b>2C14: DOWNWARD FLAME SPREAD AT VARIOUS GRAVITATIONAL LEVELS IN VERTICAL NARROW CHANNELS</b> .....	1613
<i>M. Saitta, F.J. Miller, S. Olson, I. Wichman</i>	

### **FLAME SPREAD II**

<b>2C15: EXPERIMENTAL AND THEORETICAL STUDY ON DOWNWARD FLAME SPREAD OVER TWO PARALLEL PMMA SLABS IN DIFFERENT PRESSURE ENVIRONMENTS</b> .....	1619
<i>K. Zhao, L. Yang, W. Tang, M. Gollner</i>	

<b>2C16: CORRELATING THE BURNING RATE WITH SPREAD RATE FOR DOWNWARD FLAME SPREAD OVER PMMA</b> .....	1625
<i>S. Bhattacharjee, L. Carmignani, B. Rhoades</i>	
<b>2C17: GAP HEIGHT INFLUENCE ON THIN FUEL FLAME SPREAD IN A NARROW CHANNEL</b> .....	1630
<i>S. Hossain, G. Sidebotham, S.L. Olson, F.J. Miller, I.S. Wichman</i>	
<b>2C18: TRANSIENT FLAME GROWTH AND SPREAD PROCESSES OVER THIN SOLIDS IN CONCURRENT LOW-SPEED FLOWS IN MICROGRAVITY – A COMPARISON BETWEEN LARGE AND SMALL SAMPLE SIZES</b> .....	1636
<i>C. Li, Y.-T.T. Liao</i>	
<b>2C19: OPPOSED FLOW FLAME SPREAD OVER THICK DEGRADING COMBUSTIBLE MATERIALS</b> .....	1643
<i>Y. Chu, I.S. Wichman</i>	

### **OXYGENATED FUELS I**

<b>2D01: AUTOIGNITION OF METHYL VALERATE AT LOW TO INTERMEDIATE TEMPERATURES AND ELEVATED PRESSURES IN A RAPID COMPRESSION MACHINE</b> .....	1649
<i>B.W. Weber, J. Bunnell, K. Kumar, C.-J. Sung</i>	
<b>2D02: DEVELOPMENT OF A CHEMICAL KINETIC MECHANISM FOR BIODIESEL SURROGATE</b> .....	1658
<i>A.D. Lele, A. Krishnasamy, K. Narayanaswamy</i>	
<b>2D03: A DETAILED CYCLIC ETHER OXIDATION MECHANISM FOR TETRAHYDROFURAN RADICALS: A THEORETICAL STUDY</b> .....	1664
<i>H. Wang, S.M. Sarathy</i>	
<b>2D04: SHOCK TUBE INVESTIGATIONS OF METHYL TERT BUTYL ETHER AND METHYL TETRAHYDROFURAN HIGH-TEMPERATURE KINETICS</b> .....	1670
<i>S. Jouzdani, A. Zhou, B. Akih-Kumgeh</i>	

### **COAL PYROLYSIS AND GASIFICATION**

<b>2D05: CO-GASIFICATION OF POWDER RIVER BASIN COAL AND BIOCHAR IN CARBON DIOXIDE</b> .....	1677
<i>E. Beagle, Y. Wang, D. Bell, E. Belmont</i>	
<b>2D06: MISCANTHUS GASIFICATION IN A DOWNDRAFT GASIFIER</b> .....	1683
<i>T. Sharma, D. Yepes, R. Nascimento, Y. Shi, G. Zang, A. Ratner, E.S. Lora</i>	
<b>2D07: CRACK FORMATION DURING MATERIAL THERMAL DEGRADATION IN COMBUSTION</b> .....	1689
<i>Y. Nguyen, T.J. Pence, I.S. Wichman</i>	
<b>2D08: A COMPREHENSIVE MODEL FOR PREDICTING ELEMENTAL COMPOSITION OF COAL PYROLYSIS PRODUCTS</b> .....	1695
<i>A.P. Richards, T. Shutt, T.H. Fletcher</i>	
<b>2D09: SYNERGISTIC EFFECTS IN STEAM GASIFICATION OF COMBINED BIOMASS AND PLASTIC WASTE MIXTURES</b> .....	1700
<i>K.G. Burra, A.K. Gupta</i>	

### **COMPUTATIONAL ANALYSIS III**

<b>2D10: AN ITERATIVE UNCOUPLED QUASI-STEADY-STATE METHOD FOR DYNAMIC CHEMICAL STIFFNESS REMOVAL</b> .....	1706
<i>C. Xu, T. Lu</i>	
<b>2D11: INVESTIGATING STIFFNESS DETECTION METRICS FOR CHEMICAL KINETICS</b> .....	1712
<i>A. Alferman, K.E. Niemeyer</i>	
<b>2D12: ASSESSMENT OF STIFFNESS REDUCTION IN CHEMICAL REACTING SYSTEMS USING PRINCIPAL COMPONENT ANALYSIS</b> .....	1720
<i>E. Armstrong, M.A. Hansen, J.C. Sutherland</i>	
<b>2D13: SIMD-VECTORIZED CHEMICAL SOURCE TERM EVALUATION</b> .....	1730
<i>N. Curtis, C.-J. Sung</i>	
<b>2D14: USING GLOBAL PATHWAY TO UNDERSTAND CHEMICAL KINETICS</b> .....	1738
<i>X. Gao, W. Sun</i>	

### **COMPUTATIONAL ANALYSIS IV**

<b>2D15: TIME SCALE ANALYSIS FOR RATE-CONTROLLED CONSTRAINED-EQUILIBRIUM CONSTRAINT SELECTION</b> .....	1744
<i>F. Hadi, V. Yousefian, M.R.H. Sheikhi, H. Metghalchi</i>	
<b>2D16: COMBUSTION SIMULATION OF PROPANE/AIR MIXTURES USING RATE-CONTROLLED CONSTRAINED-EQUILIBRIUM</b> .....	1750
<i>G. Yu, H. Metghalchi, O. Askari</i>	
<b>2D17: CAPTURING COMPONENT INTERACTIONS IN A REDUCED MULTI-COMPONENT FUEL MECHANISM</b> .....	1756
<i>L. Backer, P. Pepiot</i>	



<b>2D18: AN IMPROVED PRE-PARTITIONED ADAPTIVE CHEMISTRY METHODOLOGY FOR PARTICLE PDF METHODS</b> .....	1762
<i>A.S. Newale, Y. Liang, P. Pepiot, S.B. Pope</i>	
<b>2D19: UCONNRCMPY: PYTHON-BASED DATA ANALYSIS FOR RAPID COMPRESSION MACHINES</b> .....	1768
<i>B.W. Weber, C.-J. Sung</i>	

## **DNS I**

<b>2E01: A NOVEL FLAMELET-BASED MODEL FOR 3D DNS OF MILD COMBUSTION WITH CH<sub>4</sub>/H<sub>2</sub> FUELS</b> .....	1776
<i>E. Abtahizadeh, J. van Oijen, R. Bastiaans, P. de Goey</i>	
<b>2E02: DNS OF SPHERICALLY EXPANDING TURBULENT PREMIXED FLAMES OF PRESSURIZED LEAN METHANE/AIR MIXTURES IN HOMOGENEOUS ISOTROPIC TURBULENCE</b> .....	1782
<i>R. Buttay, T. Kulkarni, S. Luca, A. Attili, F. Bisetti</i>	
<b>2E03: DIRECT NUMERICAL SIMULATION OF A TURBULENT NONPREMIXED “COOL” FLAME</b> .....	1788
<i>A.G. Novoselov, M.E. Mueller</i>	
<b>2E04: A DIRECT NUMERICAL SIMULATION STUDY OF THE QUENCHING OF JET FUEL FLAME KERNELS SUBJECT TO INTENSE ISOTROPIC TURBULENCE</b> .....	1794
<i>A. Krisman, T. Lu, J.H. Chen</i>	

## **DNS II**

<b>2E05: EFFECTS OF PRESSURE FLUCTUATIONS ON THE COMBUSTION PROCESS IN TURBULENT PREMIXED FLAMES</b> .....	1800
<i>G. Beardsell, G. Blanquart</i>	
<b>2E06: ASSESSING THE IMPORTANCE OF MULTICOMPONENT TRANSPORT PROPERTIES USING DIRECT NUMERICAL SIMULATIONS OF PREMIXED, TURBULENT FLAMES</b> .....	1807
<i>A.J. Fillo, J. Schlup, G. Blanquart, K.E. Niemeyer</i>	
<b>2E07: DIRECT NUMERICAL SIMULATION OF A TURBULENT AUTOIGNITING N-DODECANE JET AT LOW-TEMPERATURE DIESEL CONDITIONS</b> .....	1820
<i>G. Borghesi, J.H. Chen, A. Krisman, T. Lu</i>	
<b>2E08: DIRECT NUMERICAL SIMULATION OF PREMIXED AUTOIGNITION IN NON-LINEAR SUBSONIC AND SONIC COMPRESSIBLE TURBULENCE</b> .....	1826
<i>C.A.Z. Towery, A.Y. Poludnenko, P.E. Hamlington</i>	
<b>2E09: MODELING DIFFERENTIAL DIFFUSION OF STRAIN-SENSITIVE GAS-PHASE SPECIES IN TURBULENT NONPREMIXED SOOTING FLAMES</b> .....	1832
<i>J.K. Lew, M.E. Mueller</i>	

## **GAS TURBINE COMBUSTION I**

<b>2E10: INVESTIGATION OF INITIAL DROPLET DISTRIBUTION AND IMPORTANCE OF SECONDARY BREAKUP MODEL ON LEAN BLOWOUT PREDICTIONS OF A MODEL GAS TURBINE COMBUSTOR</b> .....	1838
<i>J. Labahn, P.C. Ma, L. Esclapez, M. Ihme</i>	
<b>2E11: EXPERIMENTAL INVESTIGATION OF BOUNDARY LAYER FLASHBACK IN STRATIFIED SWIRL FLAMES</b> .....	1846
<i>R. Ranjan, N.T. Clemens</i>	
<b>2E12: CHEMICAL FUNCTIONAL GROUP DESCRIPTOR FOR JET FUEL SURROGATE</b> .....	1852
<i>S.H. Won, F.M. Haas, S. Dooley, F.L. Dryer</i>	
<b>2E13: EXPERIMENTAL STUDY OF THE EFFECTS OF HYDROGEN ADDITION ON THE SELF-EXCITED THERMOACOUSTIC INSTABILITY</b> .....	1858
<i>J. Zhang, A. Ratner</i>	
<b>2E14: EXPERIMENTAL CHARACTERIZATION OF FUEL-DEPENDENT RESONANCE IN A REPRESENTATIVE SWIRL COMBUSTOR</b> .....	1864
<i>J.R. Monfort, S.D. Stouffer, T.H. Hendershott, E. Corporan, A. Caswell</i>	

## **GAS TURBINE COMBUSTION II**

<b>2E15: MODEL OF COMBUSTION INSTABILITIES WITHIN A COUPLED DUAL-CHAMBER TO EXPLAIN TRENDS MEASURED IN A GAS TURBINE MODEL COMBUSTOR</b> .....	1873
<i>Y.T. Chen, J.F. Driscoll</i>	
<b>2E16: STABILITY ANALYSIS OF MULTIPLE REACTING WAKES</b> .....	1879
<i>J. Sebastian, B. Emerson, T. Liewwen</i>	
<b>2E17: MODAL ANALYSIS OF DIRECT CORE NOISE IN A MODEL COMBUSTOR</b> .....	1885
<i>J. O'Brien, F. Bake, M. Ihme</i>	
<b>2E18: SOLID-STATE ELECTROCHEMICAL NO SENSOR PERFORMANCE IN THE EXHAUST OF A COMMERCIAL 60KW GAS TURBINE</b> .....	1893
<i>R. Ehlig, E. Sullivan-Lewis, V. McDonell</i>	

<b>2E19: GAS TURBINE NVPM FORMATION AND OXIDATION SEMI-EMPIRICAL MODEL FOR COMMERCIAL AVIATION</b> .....	1899
<i>J. Abrahamson, R. Vander Wal</i>	

### **IC ENGINE MEASUREMENTS**

<b>2F01: SPARK AND LASER IGNITION OF ISO-OCTANE AND ETHANOL BLENDS</b> .....	1907
<i>N.D. Peters, B. Akih-Kumgeh</i>	
<b>2F02: THE IMPACT OF CARBON DIOXIDE AND WATER ON SINGLE-PULSE NANOSECOND DISCHARGE BEHAVIOR AT ELEVATED DENSITY</b> .....	1913
<i>B. Wolk, I. Ekoto</i>	
<b>2F03: COMPARING INFRARED EMISSION FROM HYDROCARBON C-H STRETCH DURING DIRECT INJECTION WITH AND WITHOUT REACTION IN AN OPTICAL HEAVY DUTY ENGINE</b> .....	1919
<i>W.E. Eagle, G. Roberts, M.P.B. Musculus, L.-M. Malbec, L. Sequino, E. Mancaruso</i>	
<b>2F04: CHEMICAL IMAGING IN A DIESEL-IGNITED DUAL-FUEL OPTICAL ENGINE USING HIGH-SPEED INFRARED NARROWBAND IMAGING</b> .....	1925
<i>M.-A. Gagnon, E. Mancaruso, L. Sequino, P. Tremblay, S. Savary, E. Guyot, V. Morton</i>	

### **IC ENGINES I**

<b>2F05: NUMERICAL AND EXPERIMENTAL INVESTIGATION OF CYCLIC VARIABILITY OF A LARGE BORE SPARK-IGNITED NATURAL GAS ENGINE</b> .....	1931
<i>A. Mashayekh, J. Brown, T. Jacobs, M. Patterson, J. Etchevery</i>	
<b>2F06: A COMPARISON OF COMBUSTION DYNAMICS FOR MULTIPLE 7-POINT LEAN DIRECT INJECTION COMBUSTOR CONFIGURATIONS</b> .....	1940
<i>K.M. Tacina, Y.R. Hicks</i>	
<b>2F07: ANALYSIS OF A DIFFERENTIAL STROKE CYCLE FOR HIGH FUEL EFFICIENCY</b> .....	1946
<i>Z.B. Harris, J.A. Bittle, A.K. Agrawal</i>	
<b>2F08: COMBUSTION INSTABILITIES OF ULTRA-LEAN PREMIXED H<sub>2</sub>/AIR MIXTURES BY PRECHAMBER HOT JET IGNITION</b> .....	1954
<i>S. Biswas, L. Qiao</i>	
<b>2F09: WORKING FLUID REPLACEMENT IN GASEOUS DIRECT-INJECTION INTERNAL COMBUSTION ENGINES: A FUNDAMENTAL AND APPLIED EXPERIMENTAL INVESTIGATION</b> .....	1970
<i>M. Sierra-Aznar, D.I. Pineda, B.S. Cage, X. Shi, J.P. Corvello, J.-Y. Chen, R.W. Dibble</i>	

### **IC ENGINES II**

<b>2F10: THE EFFECT OF HEAVY WORKING FLUIDS ON HYDROGEN COMBUSTION</b> .....	1976
<i>M. Shahsavan, J.H. Mack</i>	
<b>2F11: SIMULATED INVESTIGATIONS OF LOW HEAT REJECTION CONCEPTS APPLIED TO LOW TEMPERATURE COMBUSTION</b> .....	1982
<i>T. Li, J. Caton, T. Jacobs</i>	
<b>2F12: EFFECTS OF CONFINEMENT ON LEAN DIRECT INJECTION COMBUSTION USING AN AIR-BLAST ATOMIZER</b> .....	1995
<i>J. Allen, J. Kornegay, A.K. Agrawal</i>	
<b>2F13: SINGLE FUEL RCCI COMBUSTION USING REFORMED FUEL</b> .....	2003
<i>F.D.F. Chuahy, S.L. Kokjohn</i>	
<b>2F14: INTERMEDIATE COMBUSTION MODES BETWEEN CONVENTIONAL DIESEL COMBUSTION AND REACTIVITY-CONTROLLED COMPRESSION IGNITION</b> .....	2009
<i>J. Martin, A. Boehman, R. Topkar, S. Chopra, U. Subramaniam, H. Chen</i>	

### **IC ENGINES III**

<b>2F15: HOMOGENOUS CHARGE COMPRESSION IGNITION (HCCI) OPERATION WITH NAVY JET FUEL IN A WAUKESHA DIESEL CFR ENGINE</b> .....	2015
<i>K. Bowes, M. Walker, L. Hamilton, D.L. Prak, J. Cowart</i>	
<b>2F16: FLOW STRUCTURE COMPARISON FOR TWO 7-POINT LDI CONFIGURATIONS</b> .....	2021
<i>Y.R. Hicks, K.M. Tacina</i>	
<b>2F17: HEAT LOSS FROM A TURBO-CHARGED SPARK IGNITION OFF-ROAD ENGINE OPERATED ON GASEOUS FUELS</b> .....	2027
<i>A. Yao, X. Shi, H. Li, F. Xiao, T. Li, P. Zeng</i>	
<b>2F18: COMBUSTION PROCESS OF A TURBOCHARGED SI NATURAL GAS ENGINE OPERATED ON STOICHIOMETRIC MIXTURE</b> .....	2033
<i>H. Li, T. Gatts, S. Liu, S. Wayne, N. Clark, D. Mather</i>	

<b>2F19: INVESTIGATION OF SUBSTITUTION LIMITS AND EMISSIONS OF AN IN-LINE SIX CYLINDER DIESEL-NATURAL GAS DUAL FUEL ENGINE</b> .....	2039
<i>R.H. Mitchell, D.B. Olsen</i>	

### **LAMINAR FLAMES II**

<b>2G01: THERMAL-DIFFUSIONAL INSTABILITY IN WHITE DWARF FLAMES: REGIMES OF FLAME PULSATION</b> .....	2045
<i>G. Xing, Y. Zhao, M. Modestov, C. Zhou, Y. Gao, C.K. Law</i>	
<b>2G02: THE IMPACT OF PRESSURE ON METHANE COMBUSTION WITH CO<sub>2</sub> DILUTION</b> .....	2051
<i>K.R. V Manikantachari, S. Martin, J.O. Bobren-Diaz, S. Vasu</i>	
<b>2G03: GLOBAL AND LOCAL RESPONSE OF PREMIXED FLAMES DURING FLAME-VORTEX INTERACTIONS UNDER DISTINCT CONFIGURATIONS</b> .....	2057
<i>P.L.K. Paes, J.G. Brasseur, Y. Xuan</i>	
<b>2G04: THE EFFECTS OF REACTANT DILUTION ON LENGTHS OF LAMINAR GAS JET DIFFUSION FLAMES</b> .....	2063
<i>Z. Wang, P.B. Sunderland, R.L. Axelbaum</i>	

### **LAMINAR FLAMES III**

<b>2G05: ENHANCED FLAME ION PRODUCTION THROUGH EXTERNAL ELECTRIC FIELDS</b> .....	2069
<i>J. Tinajero, G. Bernard, L. Autef, D. Dunn-Rankin</i>	
<b>2G06: SIMULATIONS OF A MICRO-LITER FUEL IGNITION TESTER</b> .....	2075
<i>S. Lapointe, I. Schoegl, C. Druzgalski, M. McNeenly</i>	
<b>2G07: OBSERVATIONS OF DOUBLE REACTION ZONES IN INVERSE GAS JET DIFFUSION FLAMES</b> .....	2081
<i>Z. Wang, P.B. Sunderland, R.L. Axelbaum</i>	
<b>2G08: EXTINCTION ANALYSIS OF A METHANE-OXYGEN COUNTERFLOW FLAME AT HIGH PRESSURE</b> .....	2087
<i>A.J. Juanós, W.A. Sirignano</i>	
<b>2G09: EFFECTS OF NATURAL CONVECTION ON CRITICAL CONDITIONS FOR THERMAL EXPLOSIONS IN SPHERICAL VESSELS</b> .....	2093
<i>D. Moreno-Boza, I. Iglesias, A.L. Sánchez, A. Liñán, F.A. Williams</i>	

### **LAMINAR FLAME PROPAGATION III**

<b>2G10: EFFECT OF SURFACE CONDITIONS ON FAST FLAME ACCELERATION IN OBSTRUCTED CYLINDRICAL PIPES</b> .....	2099
<i>A. Adebiyi, D. Valiev, V. Akkerman</i>	
<b>2G11: METHANE-AIR TRIPLE FLAMES IN STRAINED MIXING LAYERS</b> .....	2105
<i>P. Rajamanickam, W. Coenen, A. L. Sánchez, F.A. Williams</i>	
<b>2G12: ANALYSIS OF NON-EQUIDIFFUSIVE PREMIXED FLAMES IN OBSTRUCTED CHANNELS</b> .....	2111
<i>A. Adebiyi, G. Idowu, D. Valiev, V. Akkerman</i>	
<b>2G13: MODEL DEVELOPMENT FOR LAMINAR FLAME SPEED OF STRATIFIED METHANE/AIR MIXTURES</b> .....	2117
<i>X. Shi, J.-Y. Chen</i>	
<b>2G14: IMPACT OF THERMAL EXPANSION AND LEWIS NUMBER ON PREMIXED FLAME PROPAGATION IN CHANNELS WITH ADIABATIC AND ISOTHERMAL, NONSLIP WALLS</b> .....	2123
<i>S.R. Shetty, S. Demir, D. Valiev, V. Akkerman</i>	

### **ENVIRONMENTAL ASPECTS I**

<b>2G15: GROUPED MONTE-CARLO SIMULATION OF MULTICOMPONENT AEROSOL DYNAMICS IN COMBUSTION PROCESSES</b> .....	2129
<i>Z. Xiao, A. Adeosun, J. Zhuo, Q. Yao, R.L. Axelbaum</i>	
<b>2G16: NANOSTRUCTURE AS A PARADIGM FOR DESCRIBING CARBON STRUCTURE, INTERPRETING ITS REACTIVITY AND QUANTIFYING ITS TRANSFORMATIONS</b> .....	2135
<i>R.L. Vander Wal, J.P. Abrahamson, M. Singh, C.K. Gaddam, K. Yehliu, C.-H. Huang</i>	
<b>2G17: SMOULDERING COMBUSTION AS AN EMERGING TECHNOLOGY FOR CONTAMINATED SITE CLEAN-UP: COMPUTATIONAL SIMULATIONS</b> .....	2142
<i>M.A.B. Zanoni, J.L. Torero, J.I. Gerhard</i>	
<b>2G18: SOOTING TENDENCIES OF RENEWABLE BIOFUELS FOR GASOLINE DIRECT-INJECTION ENGINES</b> .....	2148
<i>A.J. Vella, C.S. McEnally, D.D. Das, L.D. Pfefferle</i>	
<b>2G19: VARIATION IN THE SIZE DISTRIBUTION OF PARTICLES EMITTED FROM A BIOMASS GASIFIER COOKSTOVE WITH OPERATING MODE</b> .....	2154
<i>J. Tryner, J. Volckens, A.J. Marchese</i>	

## **TURBULENT FLAME MEASUREMENTS I**

<b>2H01: EFFECTS OF FUEL PROPERTIES ON THE STRUCTURE OF A TURBULENT BLUFF-BODY STABILIZED CONICAL PREMIXED FLAME</b> .....	2160
<i>B.R. Chowdhury, B.M. Cetegen</i>	
<b>2H02: FLAME STABILIZATION BEHAVIOR OF A HEATED REACTING PREMIXED JET IN A HOT VITIATED CROSSFLOW</b> .....	2167
<i>J. Dayton, B.M. Cetegen</i>	
<b>2H03: A DETAILED CHARACTERIZATION OF A HIGH PRESSURE EXPERIMENTAL APPARATUS FOR FLAME DYNAMIC STUDIES</b> .....	2175
<i>F. Di Sabatino, D.A. Lacoste, W.L. Roberts</i>	
<b>2H04: REACTION ZONE DETECTION AND CHARACTERIZATION FROM RAMAN/ RAYLEIGH LINE MEASUREMENTS IN METHANE/AIR FLAMES</b> .....	2181
<i>S. Hartl, D. Geyer, A. Dreizler, R.S. Barlow, C. Hasse</i>	

## **TURBULENT FLAME MEASUREMENTS II**

<b>2H05: SIMULTANEOUS PIV AND FORMALDEHYDE PLIF MEASUREMENTS IN THE BROADENED PREHEAT – THIN REACTIONS LAYER REGIME</b> .....	2187
<i>T.M. Wabel, A.W. Skiba, J.F. Driscoll</i>	
<b>2H06: EXPERIMENTAL STUDY OF THE EFFECTS OF FREE STREAM TURBULENCE ON LEAN BLOWOFF AND NEAR BLOWOFF DYNAMICS OF A BLUFF-BODY STABILIZED CONICAL PREMIXED PROPANE FLAME</b> .....	2193
<i>B.R. Chowdhury, B.M. Cetegen</i>	
<b>2H07: THE STRUCTURE OF TURBULENT PREMIXED FLAMES SUBJECTED TO EXTREME TURBULENCE AND THE DEVELOPMENT OF A NEW MEASURED REGIME DIAGRAM</b> .....	2200
<i>A.W. Skiba, T.M. Wabel, C.D. Carter, S.D. Hammack, J.E. Temme, J.F. Driscoll</i>	
<b>2H08: COMBUSTION CHARACTERISTICS OF GCH<sub>4</sub>/GO<sub>2</sub> COAXIAL JET FLAMES AT LOW-TEMPERATURE INJECTION CONDITIONS IN A MODEL COMBUSTOR</b> .....	2206
<i>S. Choi, T.Y. Kim, H.K. Kim, O.C. Kwon</i>	
<b>2H09: INVESTIGATION OF THE PILOT STAGNATION REGION IN A HIGH POWER LIQUID-FUELED COMBUSTOR</b> .....	2212
<i>R. Zhang, A.C. Pratt, R.P. Lucht, C.D. Slabaugh</i>	

## **TURBULENT FLAMES II**

<b>2H10: DETAILED TRANSITIONAL PROCESS OF THE FLAMES IN HOT AND DILUTED ENVIRONMENTS FROM LIFTED FLAMES TO MILD COMBUSTION</b> .....	2218
<i>C. Liu, J. Zhang</i>	
<b>2H11: STABILITY AND LIFTOFF OF NON-PREMIXED LARGE HYDROCARBON COMBUSTION IN MILD CONDITIONS</b> .....	2224
<i>E. Walters, P. Medwell, D.L. Blunck</i>	
<b>2H12: TURBULENT FLAME SPEED BEHAVIOR IN LEAN METHANE/AIR MIXTURES WITH APPLICATIONS TO ENGINES</b> .....	2246
<i>Z. Wang, J. Abraham</i>	
<b>2H13: SIMULATION OF THE EVOLUTION OF PREMIXED FLAME KERNELS IN A TURBULENT CHANNEL FLOW</b> .....	2252
<i>R. Ranjan, A. Panchal, B. Muralidharan, S. Menon</i>	
<b>2H14: SOOT VOLUME-FRACTION FIELDS AND KINEMATICS OF TURBULENT NON-PREMIXED JET FLAMES BURNING JET FUEL AND ITS SURROGATES</b> .....	2258
<i>O. Park, N.T. Clemens</i>	

## **TURBULENT FLAMES III**

<b>2H15: NUMERICAL STUDY OF AUTO-IGNITION IN A LIQUID N-HEPTANE JET</b> .....	2264
<i>S. Yellapantula, M. Bode, A.A. Mukundan, H. Pitsch</i>	
<b>2H16: AUTO-IGNITION DYNAMICS OF PULSED TURBULENT HYDROCARBON FUEL JETS ISSUING INTO HIGH-TEMPERATURE VITIATED COFLOWS</b> .....	2270
<i>R. Saksena, J.A. Sutton</i>	
<b>2H17: THE EFFECT OF OZONOLYSIS ACTIVATED AUTOIGNITION ON JET FLAME DYNAMICS</b> .....	2276
<i>X. Gao, W. Sun, T. Ombrello, C. Carter</i>	
<b>2H18: KARLOVITZ NUMBER EFFECTS ON VELOCITY AND SCALAR STATISTICS IN TURBULENT PREMIXED COMBUSTION</b> .....	2282
<i>J.F. MacArt, T. Grenga, M.E. Mueller</i>	
<b>2H19: EFFECTS OF KARLOVITZ NUMBER ON FLAME SURFACE WRINKLING IN LEAN METHANE/AIR FLAMES</b> .....	2288
<i>Z. Wang, J. Abraham</i>	

## SOOT IN LAMINAR FLAMES II

<b>2J01: A NUMERICAL STUDY OF THE EFFECTS OF N-PROPYLBENZENE ADDITION TO N-DODECANE ON SOOT FORMATION AND AGGREGATE STRUCTURE IN A LAMINAR COFLOW DIFFUSION FLAME</b> .....	2295
<i>T. Zhang, M.J. Thomson</i>	
<b>2J02: ON THE EFFECTS OF OXYGEN-ENRICHMENT AND FUEL UNSATURATION ON PAHS AND SOOT EMISSIONS IN ETHYLENE, PROPANE, AND PROPENE FLAMES</b> .....	2301
<i>K.C. Kalvakala, V.R. Katta, S.K. Aggarwal</i>	
<b>2J03: EFFECT OF DISTILLATE FRACTION OF REAL JET FUEL ON SOOTING PROPENSITY – PART 1: NASCENT SOOT FORMATION IN PREMIXED STRETCH-STABILIZED FLAMES</b> .....	2307
<i>C. Saggese, A.V. Singh, J. Camacho, H. Wang</i>	
<b>2J04: EFFECT OF DISTILLATE FRACTION OF REAL JET FUEL ON SOOTING PROPENSITY – PART 2: SOOT FORMATION IN NONPREMIXED COUNTERFLOW FLAMES</b> .....	2313
<i>X. Xue, C.-J. Sung, H. Wang</i>	

## SOOT IN LAMINAR FLAMES III

<b>2J05: COMPARISONS OF COMPUTED AND MEASURED SOOT DISTRIBUTION IN ETHYLENE/ HYDROGEN/ NITROGEN LAMINAR DIFFUSION FLAMES</b> .....	2320
<i>M. Yen, V. Magi, J. Abraham</i>	
<b>2J06: MULTI-ANGLE LIGHT SCATTERING FOR INVESTIGATING SOOT PARTICLE/ AGGREGATE PARAMETERS IN A COUNTERFLOW FLAME AT ELEVATED PRESSURES</b> .....	2326
<i>H.M.F. Amin, W.L. Roberts</i>	
<b>2J07: SOOT FORMATION OF CONVENTIONAL AND ALTERNATIVE JET FUELS IN COUNTERFLOW NONPREMIXED FLAMES</b> .....	2332
<i>X. Xue, X. Hui, P. Singh, C.-J. Sung</i>	
<b>2J08: SCALING OF COFLOW FLAMES AT CONSTANT REYNOLDS AND GRASHOF NUMBERS WITH APPLICATION TO SOOTING FLAMES AT ELEVATED PRESSURE</b> .....	2342
<i>A. Abdelgadir, S.A. Steinmetz, A. Attili, F. Bisetti, W.L. Roberts</i>	
<b>2J09: INFLUENCE OF CO-DIRECTIONAL, AXISYMMETRIC AIR INJECTION ON SOOT GENERATION WITHIN A LAMINAR POOL FIRE</b> .....	2350
<i>T.J. Borth, S.K. Lakkundi, K. Arsava, S.P. Kozhumal, A.S. Rangwala</i>	

## TEMPERATURE DIAGNOSTICS I

<b>2J10: A NEW METHOD TO COMPUTE THE PROPER RADIANT HEAT TRANSFER CORRECTION OF BARE-WIRE THERMOCOUPLE MEASUREMENTS</b> .....	2356
<i>C.R. Shaddix</i>	
<b>2J11: DEMOSAICING ALGORITHMS FOR THE IMPROVEMENT OF SPATIAL RESOLUTION AND ACCURACY IN COLOR RATIO PYROMETRY</b> .....	2362
<i>D. Giassi, M.B. Long</i>	
<b>2J12: A QUANTITATIVE SCHLIEREN SYSTEM FOR MICROGRAVITY FLAME DIAGNOSTICS</b> .....	2368
<i>S. Karn, F. Takahashi</i>	

## VOLUME 4

<b>2J13: VISUALIZATION OF PROBE-PERTURBED 2D TEMPERATURE FIELDS OF LAMINAR PREMIXED FLAMES</b> .....	2374
<i>N. Hansen, R.S. Tranter, K. Moshhammer, J.B. Randazzo, J.P.A. Lockhart, T. Tao, A.L. Kastengren</i>	
<b>2J14: CHARACTERIZATION OF DIFFERENT MICROFLAME BURNER DESIGNS SEEDDED WITH TAN PARTICLES THROUGH EMISSION SPECTROSCOPY</b> .....	2380
<i>Z. Diao, M. Winter, T. Hirasawa, K. Saito</i>	

## TEMPERATURE DIAGNOSTICS II

<b>2J15: TEMPERATURE MEASUREMENTS IN A TURBULENT SPRAY FLAME USING COHERENT ANTI-STOKES RAMAN SCATTERING SPECTROSCOPY</b> .....	2393
<i>A.D. Tuesta, B.T. Fisher, S.G. Tuttle</i>	
<b>2J16: FIRST-STAGE IGNITION DELAY: APPLICATION OF A FAST IN-SITU TEMPERATURE SENSOR</b> .....	2399
<i>E.F. Nasir, A. Farooq</i>	
<b>2J17: FEMTOSECOND CHIRPED-PROBE-PULSE COHERENT ANTI-STOKES RAMAN SCATTERING THERMOMETRY IN A PILOTTED SPRAY BURNER</b> .....	2405
<i>L.M. Thomas, A. Lowe, A. Satija, R.P. Lucht, A. Masri</i>	
<b>2J18: ACOUSTIC-BASED LASER INDUCED BREAKDOWN THERMOMETRY</b> .....	2413
<i>W. Wu, A. Adeosun, R.L. Axelbaum</i>	

<b>2J19: QUANTITATIVE 2D TEMPERATURE IMAGING IN TURBULENT NONPREMIXED JET FLAMES USING FILTERED RAYLEIGH SCATTERING</b> .....	2419
<i>T.A. McManus, J.A. Sutton</i>	

### COOL FLAMES

<b>2K01: KINETIC EFFECTS OF N-PROPYLBENZENE ON N-DODECANE DIFFUSION COOL FLAME EXTINCTION</b> .....	2425
<i>O.R. Yehia, C.B. Reuter, Y. Ju</i>	
<b>2K02: EXPERIMENTAL CHARACTERIZATION OF FREELY PROPAGATING PROPANE COOL FLAMES AT SUB-ATMOSPHERIC PRESSURES</b> .....	2431
<i>M. Hajilou, E. Belmont</i>	
<b>2K03: THE EFFECTS OF CH<sub>4</sub> ADDITION ON DME NON-PREMIXED COOL FLAMES</b> .....	2437
<i>R. Zhang, C.B. Reuter, Y. Ju</i>	
<b>2K04: STUDY OF THE LOW-TEMPERATURE REACTIVITY OF LARGE N-ALKANES THROUGH COOL DIFFUSION FLAME EXTINCTION</b> .....	2443
<i>C.B. Reuter, M. Lee, S.H. Won, Y. Ju</i>	

### LAMINAR FLAME PROPAGATION II

<b>2K05: PREMIXED FLAME OSCILLATIONS IN OPEN OBSTRUCTED CHANNELS</b> .....	2449
<i>A. Adebisi, A. Cathreno, D. Valiev, V. Akkerman</i>	
<b>2K06: CHARACTERISTICS OF LIFTED LAMINAR FLAMES OF METHANE DILUTED WITH NITROGEN AND HELIUM IN OXYGEN-ENHANCED CO-FLOW</b> .....	2455
<i>P. Sharma, B.Y. Gebreyesus, A. Ray</i>	
<b>2K07: FLAME PROPAGATION IN NARROW CHANNELS AT VARYING LEWIS NUMBERS</b> .....	2461
<i>S. Shen, X. Ma, J. Wongwiwat, J. Gross, P. Ronney</i>	
<b>2K08: PROPAGATION VELOCITIES FOR NEIGHBORING TRIPLE FLAMES</b> .....	2467
<i>S.W. Grib, M.W. Renfro</i>	
<b>2K09: NUMERICAL STUDY OF THERMAL GAS EXPANSION INFLUENCE ON PREMIXED FLAME PROPAGATION IN A SHEAR FLOW</b> .....	2473
<i>H. Zhong, R. Feng, D. Valiev</i>	

### MICRO-COMBUSTION/NEW CONCEPTS III

<b>2K10: CATALYTIC COMBUSTION DRIVEN THERMAL TRANSPIRATION PUMP FOR SELF-SUSTAINING POWER GENERATION DEVICES</b> .....	2478
<i>J. Wongwiwat, P.D. Ronney</i>	
<b>2K11: A SWISS ROLL STYLE COMBUSTION REACTOR FOR NON-CATALYTIC REFORMING</b> .....	2484
<i>R. Zelinsky, J. Crawmer, B. Richard, C.-H. Chen, H. Pearlman</i>	
<b>2K12: THERMAL TRANSPIRATION BASED PUMPING AND POWER GENERATION</b> .....	2490
<i>T.S. Welles, R.J. Milcarek, A. Baskaran, J. Ahn, P.D. Ronney</i>	
<b>2K13: COMPOSITE OXYGEN TRANSPORT MEMBRANE REACTORS FOR OXY-FUEL COMBUSTION PROCESSES</b> .....	2496
<i>R. Falkenstein-Smith, M. Rushby, J. Ahn</i>	
<b>2K14: A NOVEL IN-SITU COMBUSTION CONCEPT FOR HAZARDOUS WASTE CLEAN UP</b> .....	2502
<i>S. Arava, A.J. Walawalkar, K.S. Arsava, H. Sezer, A.S. Rangwala</i>	

### MICRO-COMBUSTION/NEW CONCEPTS IV

<b>2K15: AN INNOVATIVE VOLATILE ORGANIC COMPOUND INCINERATOR</b> .....	2508
<i>J. Crawmer, C.-H. Chen, B. Richard, R. Zelinsky, H. Pearlman</i>	
<b>2K16: MANIPULATING TURBULENT MIXING BEHAVIOR THROUGH PARTICLE INJECTION</b> .....	2514
<i>G. Di Cristina, S.P. Kozhumal, A. Rangwala, S.-K. Im</i>	
<b>2K17: THE VISUALIZATION AND COMBUSTION CHARACTERISTICS OF ARTIFICIAL METHANE HYDRATE FLAMES</b> .....	2520
<i>Y.-C. Chien, D. Dunn-Rankin</i>	
<b>2K18: A LINK BETWEEN O<sub>2</sub> DEFICIENT METABOLISM IN ORGANS AND GROUP COMBUSTION IN ENGINEERING</b> .....	2525
<i>K. Annamalai, M. Miller</i>	
<b>2K19: DESIGN OF COMPLEX REACTORS USING ADDITIVE MANUFACTURING</b> .....	2535
<i>P.R. Radyjowski, S.R. Newcomb, J.L. Ellzey</i>	

## PLENARY LECTURE

<b>ADVANCES IN LASER IMAGING DIAGNOSTICS FOR UNDERSTANDING TURBULENCE-FLAME INTERACTIONS</b> .....	2541
<i>J. H. Frank</i>	

## CHEMICAL KINETICS IX

<b>3A01: IGNITION DELAY TIME MEASUREMENTS IN A HIGH REPETITION RATE SHOCK TUBE SHOCK</b> .....	2560
<i>A.R. Laich, P.T. Lynch</i>	
<b>3A02: AUTOIGNITION OF LOW AND HIGH OCTANE GASOLINES</b> .....	2567
<i>A. Farooq, T. Javed, E.F. Nasir, C. Lee, A. Ahmed, H. Curran, S.M. Sarathy</i>	
<b>3A03: IGNITION DELAY MEASUREMENTS FOR ALTERNATIVE JET FUELS AT MID TO LOW TEMPERATURES</b> .....	2573
<i>G. Flora, M.S.P. Kahandawala, M. DeWitt, E. Corporan</i>	
<b>3A04: AUTOIGNITION BEHAVIOR OF JET FUEL RELEVANT PURE HYDROCARBON COMPONENTS IN A RAPID COMPRESSION MACHINE</b> .....	2579
<i>K. Min, D. Valco, A. Oldani, T. Lee</i>	

## CHEMICAL KINETICS X

<b>3A05: IGNITION DELAY MEASUREMENTS OF STRAIGHT RUN NAPHTHA</b> .....	2585
<i>M. Alabbad, G. Issayev, B. Giri, J. Badra, A. Voice, Y. Zhang, T. Tzanetakis, K. Djebbi, M. Abdulwahab, A. Ahmed, M. Sarathy, A. Farooq</i>	
<b>3A06: EFFECT OF CO<sub>2</sub> ADDITION ON SYNGAS IGNITION DELAY TIMES IN A SHOCK TUBE</b> .....	2591
<i>S. Barak, O. Pryor, J. Lopez, E. Ninnemann, S. Vasu</i>	
<b>3A07: AUTOIGNITION TEMPERATURE MEASUREMENTS OF HYDROGEN MIXTURES</b> .....	2597
<i>K. Olchewsky, C. Fuller, M. Holton, P. Gokulakrishnan</i>	
<b>3A08: ANALYTICAL EXPLOSION LIMITS OF H<sub>2</sub>/CO/O<sub>2</sub> AND H<sub>2</sub>/CH<sub>4</sub>/O<sub>2</sub> MIXTURES</b> .....	2603
<i>W. Liang, C.K. Law</i>	
<b>3A09: INVERSE LIVENGOOD-WU INTEGRATION METHOD FOR ANALYZING IGNITION DELAY TIMES IN REACTORS WITH VARYING CONDITIONS</b> .....	2609
<i>M. Tao, P. Zhao, P.T. Lynch</i>	
<b>3A10: IGNITION DELAY TIME CORRELATION OF FUEL BLENDS BASED ON LIVENGOOD-WU DESCRIPTION</b> .....	2616
<i>F. Khaled, J. Badra, A. Farooq</i>	

## FIRE IX

<b>3B01: EFFECTS OF FUEL COMPOSITION AND SIZE ON EMBER GENERATION CHARACTERISTICS FOR WILDLAND FIRE APPLICATIONS</b> .....	2622
<i>T.R. Hudson, M. Carter, D.L. Blunck</i>	
<b>3B02: FLOW VISUALIZATION OF BUOYANT INSTABILITY IN A CROSS-FLOW: AN IMPLICATION FOR FLAME SPREAD OVER FOREST FUEL BEDS</b> .....	2629
<i>N.K. Akafuah, N. Gustenyov, A. Salaimeh, K. Saito, M. Finney, S. McAllister</i>	
<b>3B03: ON THE EFFECT OF FUEL MOISTURE CONTENT ON THE SMOLDERING IGNITION OF A NATURAL FUEL BY FIREBRANDS</b> .....	2635
<i>J. Song, J.L. Urban, N. Liu, C. Fernandez-Pello</i>	
<b>3B04: THERMO-MECHANICAL BREAKAGE MECHANISM OF FIREBRANDS</b> .....	2641
<i>A. Tohidi, S. Caton, M. Gollner, N. Bryner</i>	

## FIRE X

<b>3B05: STATISTICAL DESCRIPTION OF TRANSPORT AND DEPOSITION OF FIREBRANDS IN A TURBULENT ATMOSPHERIC BOUNDARY LAYER</b> .....	2647
<i>B. Shotorban, C. Anand, S. Mahalingam</i>	
<b>3B06: PROGRESS IN MODELING WILDLAND FIRES USING COMPUTATIONAL FLUID DYNAMICS</b> .....	2653
<i>K. McGrattan</i>	
<b>3B07: LARGE EDDY SIMULATION OF UNSTABLY STRATIFIED BOUNDARY LAYER FLOW FOR UNDERSTANDING THE STRUCTURE OF WILDLAND FIRE FLAMES</b> .....	2659
<i>S. Verma, A. Trouvé</i>	
<b>3B08: UNDERSTANDING IGNITION SUSCEPTIBILITY OF WILDLAND-URBAN INTERFACE FUELS TO FIREBRAND ATTACK</b> .....	2665
<i>R.S.P. Hakes, M.J. Weston-Dawkes, S.E. Caton, E.T. Sluder, M.J. Gollner, J. Yang</i>	
<b>3B09: FRONT SHAPE COMPARISON IN DATA-DRIVEN WILDLAND FIRE SPREAD SIMULATIONS</b> .....	2671
<i>C. Zhang, M. Rochoux, A. Collin, W. Tang, M. Gollner, E. Ellicott, P. Moireau, A. Trouvé</i>	

<b>3B10: A STUDY TO INVESTIGATE PYROLYSIS OF WOOD PARTICLES OF VARIOUS SHAPES AND SIZES</b> .....	2677
<i>Y. Chen, K. Aanjaneya, A. Atreya</i>	

### **DROPLETS/SPRAY III**

<b>3C01: FUNDAMENTAL DROPLET AND COMBUSTION MEASUREMENTS OF NEAT, EMULSIFIED, AND WEATHERED CRUDE OIL SPRAY</b> .....	2683
<i>S.G. Tuttle, T.N. Loegel, K.M. Hinnant, A.D. Tuesta, B.T. Fisher</i>	
<b>3C02: INVESTIGATION OF COMBUSTION CHARACTERISTICS OF STRAIGHT VEGETABLE OIL FOR A NOVEL TWIN-FLUID FUEL INJECTOR</b> .....	2689
<i>L. Jiang, O.S. Akinyemi, V. Danh</i>	
<b>3C03: EFFECT OF ISO-PENTANOL ON THE IGNITION AND COMBUSTION OF N-HEPTANE/ AND 1-HEPTENE SPRAYS</b> .....	2695
<i>S. Sharma, S.K. Aggarwal</i>	
<b>3C04: EXPERIMENTAL STUDY OF DIMETHYL ETHER (DME) IN A SWIRL-STABILIZED SPRAY COMBUSTOR</b> .....	2701
<i>J.E. Madero, R.L. Axelbaum</i>	

### **DROPLETS/SPRAY IV**

<b>3C05: EFFECT OF NON-PARAFFINIC COMPONENT IN LOW OCTANE NAPHTHA FUEL COMBUSTION</b> .....	2707
<i>S.K. Jain, S.K. Aggarwal</i>	
<b>3C06: EXPERIMENTAL SPRAY IGNITION AND SOOT FORMING CHARACTERISTICS OF HIGH REACTIVITY GASOLINE AND DIESEL FUEL IN A HEAVY-DUTY SINGLE-HOLE INJECTOR</b> .....	2713
<i>M. Tang, J. Zhang, T. Menucci, H. Schmidt, J. Naber, S.-Y. Lee, T. Tzanetakis</i>	
<b>3C07: SIMULATIONS OF VAPORIZING DROPLETS IN TURBULENCE</b> .....	2719
<i>J. Palmore Jr., O. Desjardins</i>	
<b>3C08: USING A GMDH-TYPE NEURAL NETWORK ALGORITHM FOR MODELING OF DROPLET COMBUSTION</b> .....	2725
<i>M. Ghamari, A. Ratner</i>	
<b>3C09: EFFECTS OF ALUMINUM NANOPARTICLE ADDITIVES ON LIQUID FUEL DROPLET COMBUSTION WITH AND WITHOUT ACOUSTIC EXCITATION</b> .....	2731
<i>H. Sim, M. Plascencia, A. Vargas, J. Bennewitz, O. Smith, A. Karagozian</i>	
<b>3C10: ENERGETIC ADDITIVES TO LIQUID PROPELLANTS COMPOSED OF NITROCELLULOSE-BOUND NANOPARTICLE ASSEMBLIES OR MOLECULAR ALUMINUM CLUSTERS FOR ENHANCED DROPLET COMBUSTION</b> .....	2737
<i>P.M. Guerieri, J.B. DeLisio, R.J. Jacob, S. DeCarlo, B. Eichhorn, M.R. Zachariah</i>	

### **OXYGENATED FUELS II**

<b>3D01: HIGH-PRESSURE AUTOIGNITION OF BINARY BLENDS OF METHANOL AND DIMETHYL ETHER</b> .....	2743
<i>H. Wang, B.W. Weber, R. Fang, C.-J. Sung</i>	
<b>3D02: INFLUENCE OF BLENDING N-BUTANOL WITH ISO-OCTANE AND N-HEPTANE ON IGNITION DELAY TIMES IN A FUEL IGNITION TESTER</b> .....	2750
<i>Q. Xu, R. Leathers, D. Savage, K. Kumar, C.-J. Sung</i>	
<b>3D03: ASSESSING THE IMPACT OF REACTION RATE VARIATION ON AUTOIGNITION MODEL PERFORMANCE: BUTANOL</b> .....	2758
<i>K.E. Niemeyer, M.A. Mayer, S.K. Srumalla, R. West</i>	
<b>3D04: AN EXPERIMENTAL AND THEORETICAL KINETIC STUDY OF THE REACTION OF OH RADICALS WITH 1,4-DIOXANE</b> .....	2763
<i>F. Khaled, B.R. Giri, M. Szori, J.R. Barker, A. Farooq</i>	

### **OXY-COAL COMBUSTION**

<b>3D05: ASH DEPOSITION DURING ADVANCED OXY-COAL COMBUSTION USING MINIMUM RECYCLED FLUE GAS</b> .....	2771
<i>Y. Wang, A. Fry, J.O.L. Wendt</i>	
<b>3D06: A COMPREHENSIVE MODEL OF SINGLE PARTICLE PULVERIZED COAL COMBUSTION EXTENDED TO OXY-COAL CONDITIONS</b> .....	2777
<i>T. Holland, T.H. Fletcher</i>	
<b>3D07: A KINETIC EVALUATION ON NO<sub>2</sub> FORMATION IN THE POST-FLAME REGION OF PRESSURIZED OXY-COMBUSTION PROCESS</b> .....	2783
<i>X. Wang, Z. Liu, A. Adeosun, Y. Sun, G. Yablonsky, H. Tan, R.L. Axelbaum</i>	
<b>3D08: PREDICTING ASH DEPOSITION FROM NON-ISOTHERMAL, TURBULENT PARALLEL FLOWS</b> .....	2789
<i>Z. Yang, A. Gopan, R.L. Axelbaum</i>	



### **HETEROGENEOUS COMBUSTION III**

<b>3E01: BIOCIDAL EFFECTIVENESS OF COMBUSTION PRODUCTS OF REACTIVE MATERIALS: A PHENOMENOLOGICAL MODEL</b> .....	2795
<i>S. Wang, M. Schoenitz, S.A. Grinshpun, E.L. Dreizin</i>	
<b>3E02: AEROSOL SYNTHESIS OF PHASE PURE IODINE/IODIC BIOCIDAL MICROPARTICLES, AND THEIR PERFORMANCE AS OXIDIZERS IN THERMITE SYSTEMS</b> .....	2801
<i>T. Wu, X. Wang, M.R. Zachariah</i>	
<b>3E03: INVESTIGATING THE RELATIONSHIP BETWEEN THE ATOMIC PROPERTIES OF DOPED PEROVSKITE AND FUEL-OXIDIZER THERMITE IGNITION</b> .....	2807
<i>X. Wang, T. Wu, M.R. Zachariah</i>	
<b>3E04: EFFECT OF PURITY AND SURFACE FUNCTIONALIZATION ON STABILITY AND OXIDATION KINETICS OF BORON POWDERS</b> .....	2813
<i>X. Liu, J. Gonzales, M. Schoenitz, E.L. Dreizin</i>	

### **HETEROGENEOUS COMBUSTION IV**

<b>3E05: IMPACT OF CLUSTERING ON HETEROGENEOUS REACTIONS IN A RISER</b> .....	2819
<i>H. Goyal, J. Capecelatro, O. Desjardins, P. Pepiot</i>	
<b>3E06: INVESTIGATING THE EFFECTIVENESS OF POLYMER-ENCASED ALUMINUM CLUSTERS SUBJECTED TO HIGH HEATING RATES</b> .....	2825
<i>J.B. DeLisio, D.H. Mayo, B.W. Eichhorn, M.R. Zachariah</i>	
<b>3E07: NANOCOMPOSITE THERMITE POWDERS WITH IMPROVED FLOWABILITY PREPARED BY MECHANICAL MILLING</b> .....	2831
<i>Q. Nguyen, C. Huang, M. Schoenitz, K.T. Sullivan, E.L. Dreizin</i>	
<b>3E08: ENHANCED COMBUSTION CHARACTERISTICS OF ELECTROSPRAY ASSEMBLED NANOTHERMITE COMPOSITES</b> .....	2837
<i>R.J. Jacob, E. Wainwright, M. Mueller, T.P. Weihs, M.R. Zachariah</i>	
<b>3E09: MAGNESIOTHERMITE COMBUSTION SYNTHESIS OF ZIRCONIUM DIBORIDE</b> .....	2843
<i>S. Cordova, L.I. Gutierrez Sierra, E. Shafirovich</i>	
<b>3E10: BURN RATE ENHANCEMENT OF A SOLID NITROCELLULOSE MONOPROPELLANT USING FUNCTIONALIZED GRAPHENE FOAM MICROSTRUCTURE</b> .....	2849
<i>S. Jain, L. Qiao</i>	

### **IC ENGINE CHEMISTRY II**

<b>3F01: EVALUATION OF ETHANOL SUBSTITUTION IN DIESEL ENGINES: ON-ENGINE LABORATORY DEMONSTRATION</b> .....	2859
<i>C. Van Roekel, D.B. Olsen</i>	
<b>3F02: ANALYSIS OF ACOUSTIC PRESSURE RESPONSE IN HYDROCARBON-OXYGEN STRAINED DIFFUSION FLAMES</b> .....	2865
<i>A.D. Weiss, W. Coenen, C. Jiménez, A.L. Sánchez, F.A. Williams</i>	
<b>3F03: A KINETIC MODELING STUDY ON OCTANE RATING AND FUEL SENSITIVITY UNDER HCCI CONDITIONS</b> .....	2871
<i>T. Wu, M. Tao, H. Ge, D. DelVescovo, P. Zhao</i>	
<b>3F04: APPLICATION OF RESPONSE SURFACE METHODOLOGY TO INVESTIGATE THE HOT-JET IGNITION OF METHANE-HYDROGEN MIXTURES IN A CONSTANT-VOLUME COMBUSTOR</b> .....	2878
<i>A. Tarraf, R. Ebrahimi, M.E. Feyz, R. Nalim</i>	

### **IC ENGINE CHEMISTRY III**

<b>3F05: EXPERIMENTAL AND NUMERICAL STUDY OF DIESEL VS. DME IN A CONSTANT VOLUME COMBUSTION VESSEL</b> .....	2884
<i>L. Zhao, A. Abdul Moiz, X. Zhu, S.-Y. Lee</i>	
<b>3F06: LUBE OIL CHEMISTRY INFLUENCES ON AUTOIGNITION AS MEASURED IN AN IGNITION QUALITY TESTER</b> .....	2890
<i>F.M. Haas, S.H. Won, F.L. Dryer, C. Pera</i>	
<b>3F07: DURABILITY TESTING OF BIOMASS BASED OXYGENATED FUEL COMPONENTS IN A COMPRESSION IGNITION ENGINE</b> .....	2896
<i>M.E. Baumgardner, A. Lakshminarayanan, D. Olsen, M.A. Ratcliff, R.L. McCormick, A.J. Marchese</i>	
<b>3F08: SURROGATE FUEL FORMULATION FOR LIGHT NAPHTHA FUEL</b> .....	2902
<i>K. Al-Qurashi, I. Khesho, W. Roberts</i>	

## LAMINAR FLAMES IV

<b>3G01: AUTOIGNITION OF JET FUELS AND SURROGATES IN NONPREMIXED FLOWS AT ELEVATED PRESSURES</b> .....	2906
<i>G. Mairinger, A. Frassoldati, A. Cuoci, E. Pucher, K. Seshadri</i>	
<b>3G02: COMPARATIVE STUDY OF HYBRID MULTI-TIMESCALE AND G-SCHEME METHODS FOR MARCS WITH DETAILED CHEMICAL KINETICS</b> .....	2912
<i>W. Sun, L. Wang, T. Grenga, Y. Ju</i>	
<b>3G03: A METHOD FOR MEASUREMENT OF SPATIALLY RESOLVED RADIATION INTENSITY AND RADIATIVE FRACTION OF LAMINAR FLAMES OF GASEOUS AND SOLID FUELS</b> .....	2918
<i>C. Hamel, F. Raffan-Montoya, S. Stolarov</i>	
<b>3G04: UNDERSTANDING CRYSTAL PHASE EQUILIBRIUM OF TiO<sub>2</sub> IN FLAMES</b> .....	2924
<i>C. Liu, J. Camacho, H. Wang</i>	

## LAMINAR FLAMES V

<b>3G05: LEAN FLAMMABILITY LIMIT OF PURE HYDROCARBON FUELS AND AVIATION FUELS</b> .....	2930
<i>A. Li, G. Kilaz, L. Qiao</i>	
<b>3G06: LEAN FLAMMABILITY LIMITS OF RENEWABLE GAS MIXTURES AT ELEVATED TEMPERATURES AND PRESSURES</b> .....	2943
<i>D. Jaimes, V. McDonell</i>	
<b>3G07: PARAMETRIC STUDY OF THE IMPACT OF VITIATION ON FUNDAMENTAL REACTOR/FLAME CHARACTERISTICS</b> .....	2949
<i>K.B. Brady, B.A. Rankin, A.W. Caswell</i>	
<b>3G08: HOT SURFACE IGNITION OF ETHYLENE-AIR MIXTURES: SELECTION OF REACTION MODELS FOR CFD SIMULATIONS</b> .....	2957
<i>R. Mével, J. Melguizo-Gavilanes, L.R. Boeck, J.E. Shepherd</i>	
<b>3G09: COMPUTATIONAL STUDY OF PREMIXED FLAME PROPAGATION IN A GASEOUS-DUSTY ENVIRONMENT WITH VARIOUS DUST DISTRIBUTIONS</b> .....	2963
<i>S. Demir, H. Sezer, T. Bush, V. Akkerman</i>	
<b>3G10: CHARACTERISTICS AND PARAMETERIZATION OF SPRAY COMBUSTION IN LAMINAR COUNTER-FLOW JET FLAMES</b> .....	2969
<i>U. Jain, C. Han, H. Wang</i>	

## TURBULENT FLAME CHEMISTRY I

<b>3H01: INFLUENCE OF LARGE AROMATIC SPECIES ON SOOT FORMATION IN TURBULENT NON-PREMIXED JET FLAMES</b> .....	2981
<i>A. Jain, Y. Xuan</i>	
<b>3H02: EFFECTS OF TURBULENT UNSTEADINESS ON AROMATIC SPECIES IN A TURBULENT PLANAR JET FLAME</b> .....	2987
<i>A. Jain, P. Patki, Y. Xuan</i>	
<b>3H03: EFFECT OF LOW-TEMPERATURE REACTIVITY ON THE TURBULENT COMBUSTION OF N-OCTANE/ISO-OCTANE MIXTURES IN A REACTOR-ASSISTED TURBULENT SLOT BURNER</b> .....	2993
<i>C.B. Reuter, O.R. Yehia, S.H. Won, Y. Ju</i>	
<b>3H04: IMPACT OF FUEL CHEMISTRY AND STRETCH RATE ON THE GLOBAL CONSUMPTION SPEED OF LARGE HYDROCARBON FUEL/AIR FLAMES</b> .....	2999
<i>A.J. Fillo, J.M. Bonebrake, D.L. Blunck</i>	

## TURBULENT FLAME CHEMISTRY II

<b>3H05: SENSITIVITY TO CHEMICAL KINETICS MODELS IN TIME-EVOLVING TURBULENT NON-PREMIXED FLAMES</b> .....	3011
<i>S. Yang, R. Ranjan, V. Yang, W. Sun, S. Menon</i>	
<b>3H06: SENSITIVITY OF CHEMICAL PATHWAYS TO REACTION MECHANISMS FOR N-DODECANE</b> .....	3017
<i>D. Dasgupta, W. Sun, M. Day, T. Lieuwen</i>	
<b>3H07: A GRAPHICAL USER INTERFACE FOR MODEL REDUCTION OF COMPLEX FUELS BASED ON PRINCIPAL COMPONENT ANALYSIS AND ARTIFICIAL NEURAL NETWORKS</b> .....	3023
<i>S. Alqahtani, T. Echekki</i>	
<b>3H08: EFFECTS OF TURBULENT ADVECTION ON THERMOCHEMICAL TRAJECTORIES IN PREMIXED FLAMES</b> .....	3029
<i>P.E. Hamlington, R. Darragh, A.Y. Poludnenko</i>	

## **COMBUSTOR DESIGN**

<b>3J01: DESIGN AND CHARACTERIZATION OF A TWO-STAGE HENCKEN BURNER FOR COMBUSTION OF SOLID FUELS</b> .....	3035
<i>A. Adeosun, Q. Huang, T. Li, S. Li, R.L. Axelbaum</i>	
<b>3J02: SCALING AND BURNER DESIGN CONCEPTS OF A STAGED-PRESSURIZED OXY-COMBUSTION BOILER</b> .....	3042
<i>A. Gopan, Z. Yang, A. Adeosun, B.M. Kumfer, R.L. Axelbaum</i>	
<b>3J03: A TRANSIENT STATE-SPACE HEAT TRANSFER MODEL OF NATURAL DRAFT BIOMASS FUELED ROCKET STOVES</b> .....	3048
<i>G. Allawatt, D. Udensen, A. Pundle, B. Sullivan, P. Means, N. Figliola, J. Kramlich, J.D. Posner</i>	
<b>3J04: AUTOIGNITION OF LIQUID HYDROCARBON DROPLETS IN LEAN, HIGH PRESSURE NATURAL GAS MIXTURES IN A RAPID COMPRESSION MACHINE</b> .....	3054
<i>C. Gould, S. Bhoite, M. Baumgardner, J. Mohr, C. Dumitrache, A.J. Marchese</i>	

## **DIAGNOSTIC IV**

<b>3J05: TURBULENCE MEASUREMENTS IN A DIESEL FUEL SPRAY USING RAINBOW SCHLIEREN DEFLECTOMETRY</b> .....	3060
<i>C.T. Wanstall, A.K. Agrawal, J.A. Bittle</i>	
<b>3J06: A CLOSER LOOK AT DETERMINING FLAME SPEEDS WITH IMAGING DIAGNOSTICS</b> .....	3069
<i>R. Bratton, M.L. Pantoya</i>	
<b>3J07: WHOLE-FLAME IMAGE ANALYSIS USING GEOMETRIC AND COMPLEXITY MEASURES</b> .....	3075
<i>C.E.A. Finney, C.W. Kulp, C.S. Dav, T.A. Fuller, T.J. Flynn, T. Osborne, N. Stewart</i>	
<b>3J08: TOWARDS SEEDLESS VELOCIMETRY IN REACTING FLOWS USING A WAVELET-BASED OPTICAL FLOW TECHNIQUE</b> .....	3081
<i>B.E. Schmidt, J.A. Sutton</i>	
<b>3J09: DEMONSTRATION OF A DUAL-PULSE LASER HEATING TECHNIQUE FOR IGNITION OF PROPANE-AIR MIXTURES</b> .....	3087
<i>C. Dumitrache, R. VanOsdol, C.M. Limbach, A. Yalin</i>	
<b>3J10: JOINT SOOT TEMPERATURE-VOLUME FRACTION STATISTICS OF BUOYANT TURBULENT DIFFUSION FLAMES IN AIR AND REDUCED-OXYGEN ENVIRONMENT</b> .....	3093
<i>D. Zeng, G. Agarwal, Y. Wang</i>	

## **ENVIRONMENTAL ASPECTS II**

<b>3K01: OPTICAL PROPERTIES OF FLAME-SYNTHEZED CARBON NANOPARTICLES</b> .....	3099
<i>A.V. Singh, C. Liu, K. Wan, H. Wang</i>	
<b>3K02: IONIZATION ENERGY OF FLAME-SYNTHEZED CARBON NANOPARTICLES</b> .....	3105
<i>C. Liu, K. Wan, A.V. Singh, H. Wang</i>	
<b>3K03: ANALYZING THE ROBUSTNESS OF YSI AS A MEASURE OF SOOTING TENDENCY</b> .....	3111
<i>M.J. Montgomery, C.S. McEnally, D.D. Das, L.D. Pfefferle</i>	
<b>3K04: MEASUREMENTS AND PREDICTION OF SOOTING TENDENCIES OF PURE HYDROCARBONS</b> .....	3117
<i>D.D. Das, P. St. John, C.S. McEnally, S. Kim, L.D. Pfefferle</i>	

## **SUPERSONIC COMBUSTION**

<b>3K05: MID-INFRARED IMAGING OF AN OPTICALLY ACCESSIBLE NON-PREMIXED ROTATING DETONATION ENGINE</b> .....	3123
<i>B.A. Rankin, J.R. Codoni, K.Y. Cho, J.L. Hoke, F.R. Schauer</i>	
<b>3K06: MODELING AND SIMULATION OF THE INLET MIXING PROCESS IN A ROTATING DETONATION ENGINE</b> .....	3133
<i>K. Grogan, B. Rankin, M. Ihme</i>	
<b>3K07: SCRAMJET CAVITY IGNITION USING NANOSECOND-PULSED HIGH-FREQUENCY DISCHARGES</b> .....	3139
<i>T. Ombrello, J.K. Lefkowitz, S.D. Hammack, C. Carter, K. Busby</i>	
<b>3K08: HYPERSPECTRAL IMAGING DIAGNOSTICS OF A SCRAMJET COMBUSTOR CAVITY</b> .....	3145
<i>M.R. Rhoby, A.M. Kerst, K.C. Gross, T.M. Ombrello</i>	
<b>3K09: HEAT TRANSFER EVALUATION OF A HVOF COMBUSTOR UNDER SEVERAL OPERATING PARAMETERS WITH INTEREST IN PLASMA PRODUCTION FOR FUTURE MHD CHANNEL ANALYSIS</b> .....	3151
<i>E.D. Zeuthen, C.R. Woodside, H. Kim, E.D. Huckaby, D.L. Blunck</i>	
<b>3K10: SIMULATING INTERACTIONS OF DETONATION, IONIZATION CHEMISTRY, AND MAGNETOHYDRO-DYNAMICS</b> .....	3157
<i>M.F. Zaiger, D.L. Blunck, K.E. Niemeyer</i>	

**Author Index**