Fall Technical Meeting of the Western States Section of the Combustion Institute (WSS/CI 2017 Fall Meeting)

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2 – 3 October 2017

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WSS/CI Western States Section/Combustion Institute

2017 FALL TECHNICAL MEETING
WESTERN STATES SECTION OF THE COMBUSTION INSTITUTE
Hosted by University of Wyoming, Laramie, WY

Sunday, 1 October 2017

4:00 pm **WSSCI Board Meeting:** Salon B in the University of Wyoming Conference Center

Monday, 2 October 2017

7:30 – 5:00 **Registration:** University of Wyoming Conference Center Lobby
7:30 – 8:00 **Continental Breakfast:** University of Wyoming Conference Center Lobby
8:00 - 8:15 **Welcome Address:** Dr. Edmund Synakowski, *Vice President for Research and Economic Development, University of Wyoming*
Welcome Remarks: Prof. Fletcher Miller, *WSSCI Chair, San Diego State University*
Prof. Erica Belmont, *University of Wyoming*

8:15 – 9:15 **Plenary Lecture in Salon C: Dr. Timothy Ombrello, *Air Force Research Lab***
Session Chair: Erica Belmont, *University of Wyoming*

9:15 – 9:25	**BREAK**		
	Laminar Flames I **Salon A** **Session Chair:** A.L. Sánchez	**Turbulent Flames I** **Salon B** **Session Chair:** G. Blanquart	**Fire I** **Salon C** **Session Chair:** S. McAllister
9:25 – 9:45	**1A01:** Porous wall-fed liquid fueled miniature tubular flame burner *V.M. Sauer, J.S. Batther, D. Dunn-Rankin*	**1B01:** Flame stability of turbulent premixed jet flames of large hydrocarbon fuels *N.E. Schorn, J. Bonebreak, D.L. Blunck*	**1C01:** Investigation of merging flames in horizontal and vertical geometries *M. Rhamati, C. Harper, M. Butler, T.H. Fletcher*
9:45 – 10:05	**1A02:** Flame propagation in narrow channels at varying Lewis number *X. Ma, S. Shen, J. Wongwiwat, J. Gross, P. Ronney*	**1B02:** Implementing and assessing the importance of multicomponent transport properties using direct numerical simulations of premixed, turbulent flames *A.J. Fillo, J. Schlup, G. Blanquart, K.E. Niemeyer*	**1C02:** Modeling the Coanda effect with FDS and STARCCM+ to predict the effect of fires on slopes for implications of wildland firefighter safety *B. Billings, M. Roberts, B. Butler, T.H. Fletcher*
10:05 – 10:25	**1A03:** Laminar flame speeds of associated gas mixtures measured with flat flame method *F. Arafin, E. Belmont*	**1B03:** Dependence of intermittency on turbulence intensity, fuel type, and simulation fidelity in premixed reacting flows *S.H.R. Whitman, C.A.Z. Towery, A.Y. Poludnenko, P.E. Hamlington*	**1C03:** Plume attachment in wildfires on slopes: Temperature measurements in a laboratory-scale analog *T.P. Grumstrup, M.A. Finney*
10:25 – 10:45	**1A04:** Experimental and numerical study of freely propagating propane cool flames *M. Hajilou, E. Belmont*	**1B04:** Lagrangian analysis of enstrophy in turbulent premixed flames *R. Darragh, C.A.Z. Towery, A.Y. Poludnenko, P.E. Hamlington*	**1C04:** The onset of puffing of pool fires *W. Coenen, D. Moreno, A.L. Sánchez, F.A. Williams*
10:45 – 11:00	**BREAK**		

	Laminar Flames II **Salon A** **Session Chair:** Y.-C. Chien	**Turbulent Flames II** **Salon B** **Session Chair:** P. Hamlington	**Fire II** **Salon C** **Session Chair:** S. Bhattacharjee
11:00 – 11:20	**1A05:** Temperature profiles and extinction limits of a coflow water-laden methane/air diffusion flame *M. Vicariotto, P. Martinez, D. Dunn-Rankin*	**1B05:** PLIF-assisted discrimination of gas and liquid velocities for 5 kHz PIV in a liquid-fueled pressurized combustor *H. Ozogul, H. Ek, I. Chterev, B. Emerson, T. Lieuwen*	**1C05:** Model sensitivities in LES predictions of buoyant methane fire plumes *H. Koo, J.C. Hewson, S.P. Domino, R.C. Knaus*
11:20 – 11:40	**1A06:** Experimental and computational investigation of autoignition of jet fuels and surrogates in nonpremixed flows at elevated pressures *G. Mairinger, A. Frassoldati, A. Cuoci, M. Pelucchi, E. Pucher, K. Seshadri*	**1B06:** Laboratory investigation of down-scaling effects on low swirl burners *A. Frank, P. Therkelsen, J.-Y. Chen, V.H. Rapp, R.K. Cheng*	**1C06:** Direct numerical simulation of wildland fires at small scales *N.T. Wimer, A.S. Makoweicki, A.Y. Poludnenko, C.M. Hoffman, J.W. Daily, G.B. Rieker, P.E. Hamlington*
11:40 – 12:00	**1A07:** A novel formulation for unsteady counterflow flames using a thermal-conductivity-weighted coordinate *A. Weiss, M. Vera, A. Liñán, A.L. Sánchez, F. Williams*	**1B07:** Evaporation and autoignition studies of liquid n-alkane droplets in lean, high pressure methane/air mixtures in a rapid compression machine *J. Mohr, C. Gould, A. Zdanowicz, A. Marchese*	**1C07:** The effect of pressure and external heating on the Nomex flame spread limits (LOC) *M. Thomsen, X. Huang, C. Fernandez-Pello, A. Alonso, D.L. Urban, G.A. Ruff*
12:00 – 12:20	**1A08:** Global diffusion flame extinction strain rate experiments of single large hydrocarbon fuels *A. Jadhav, R. Alsulami, B.C. Windom*	**1B08:** Preliminary study of the interactions between detonation chemistry and magnetohydrodynamics *M.F. Zaiger, K.E. Niemeyer*	**1C08:** Heat transfer optimization in simulated microgravity combustion *S. Hossain, I.S. Wichman*
12:20 – 1:20	**LUNCH –** Box Lunches are available in the University of Wyoming Conference Center Lobby **Women in Combustion Lunch –** Salon B		
	Microcombustion and Transport **Salon A** **Session Chair:** P.D. Ronney	**Kinetics I** **Salon B** **Session Chair:** K.E. Niemeyer	**Fire III** **Salon C** **Session Chair:** T.P. Grumstrup
1:20 – 1:40	**1A09:** Hydrocarbon-fueled electrical power generator with no moving parts *J. Wongwiwat, P. Bhuripanyo, V. McCloyn, P. Ronney*	**1B09:** Uncertainty of transport parameters in flame models: A database from virial coefficient measurements *D.I. Pineda, T.A. Casey, X. Shi, J.-Y. Chen*	**1C09:** Correlating mass burning rate and flame spread rate for thin PMMA: Implications on pyrolysis temperature *L. Carmignani, S. Bhattacharjee*
1:40 - 2:00	**1A10:** Impact of pressure on simulated FREI combustion *P. Sharma, M. Ayoobi, M. McNenly, I. Schoegl*	**1B10:** Influence of blending methyl decanoate with *n*-decane on ignition delay times in a fuel ignition tester *R. Leathers, S. Stuhlman, K. Kumar, S. Beyerlein, C.-J. Sung*	**1C10:** Two-dimensional heat transfer analysis within non-thermally thin poly(methyl methacrylate) that is burned in a narrow channel apparatus *N.A. Lage, F.J. Miller*
2:00 - 2:20	**1A11:** Computational performance of chemistry and transport calculations in NGA *J. Schlup, N. Burali, G. Beardsell, G. Blanquart*	**1B11:** Ignition delay times and Derived Cetane Numbers of canola, corn, and soy derived bio-diesel *S. Stuhlman, C. Dunkel, R. Leathers, K. Kumar, D. Shrestha, S. Beyerlein, C.-J. Sung*	**1C11:** Temperature measurement of glowing firebrands with multi-color pyrometry *J.L. Urban, D. Shirazi, M. Vicariotto, D. Murphy, D. Dunn-Rankin, C. Fernandez-Pello*

	Microcombustion and Transport **Salon A** **Session Chair:** P.D. Ronney	**Kinetics I** **Salon B** **Session Chair:** K.E. Niemeyer	**Fire III** **Salon C** **Session Chair:** T.P. Grumstrup
2:20 - 2:40	**1A12:** Modeling a pressurized coal feed system *T. Schroedter, B. Adams*	**1B12:** Missing experimental data and rate parameter inference for H_2+OH=H_2O+H *T.A. Casey, H. Najm*	**1C12:** Pyrolysis of live vegetation at slow heating rates *E. Amini, M.-S. Safdari, M. Rahmati, J. Howarth, J. DeYoung, T.H. Fletcher*
2:40 – 3:00	**1A13:** A new efficient model for multicomponent membrane separation and application to the Argon Power Cycle *F. Chourou, M.S. Aznar, J.-Y. Chen, A. Dreizler*	**1B13:** Probing the pyrolysis chemistry of ethyl propionate in a microreactor *C. Rogers, J. Porterfield, J. Daily, B. Ellison, N. Labbe*	**1C13:** Effect of reduced plume entrainment on the burning rate of porous fuel beds *S. McAllister*
3:00 - 3:15	**BREAK**		
	Innovative Technologies **Salon A** **Session Chair:** J. Cole	**Kinetics II** **Salon B** **Session Chair:** H. Najm	**Coal and Biomass I** **Salon C** **Session Chair:** B. Adams
3:15 - 3:35	**1A14:** Kinetic study of ethane pyrolysis in an internal combustion engine *Z. Taie, D. Wagner, C. Hagen*	**1B14:** A new jet-stirred reactor for chemical kinetics experiments *A.A. Davani, P.D. Ronney*	**1C14:** Comparison of laminar pulverized coal flame experiment and simulation *C. Dunn, E. Beagle, M. Stoellinger, E. Belmont*
3:35 - 3:55	**1A15:** Flame stability and liftoff heights of a surrogate jet fuel burned near MILD combustion conditions *P. Weide, D. Blunck*	**1B15:** Numerical design of a novel microreactor to study short residence time combustion *T. Fan, C. Rogers, J.W. Daily, B. Ellison, N. Labbe*	**1C15:** A fast-running simulation tool for axisymmetric oxy-coal combustors *T. Williams, B. Adams*
3:55 - 4:15	**1A16:** Estimation of multiple model parameters using a data-assimilated CFD algorithm *Y. Wang, X. Gao*	**1B16:** Comparison and analysis of chemical kinetic models for toluene autoignition *M.A. Mayer, K.E. Niemeyer*	**1C16:** Modeling effects of annealing on coal char reactivity to O_2 and CO_2 based on preparation conditions *T. Holland, T.H. Fletcher*
4:15 – 4:35	**1A17:** Investigation of argon oxy combustion with low molecular weight fuels: Improving thermodynamic efficiency *C. Scudiere, J.-Y. Chen, R. Dibble, M. Aznar*	**1B17:** Investigating stiffness detection metrics for chemical kinetics *A. Alferman, K.E. Niemeyer*	**1C17:** Co-gasification of coal and biochar in modified drop tube reactor and TGA *E. Beagle, Y. Wang, D. Bell, E. Belmont*
4:35 – 4:55	**1A18:** Preliminary design and development of an ultra high efficiency Stirling engine heater head *M.S. Aznar, A. Frank, P.L. Therkelesen, V. Rapp, R.K. Cheng*	**1B18:** pyMARS: An open software package for reducing chemical kinetics models *P.O. Mestas, P. Clayton, K.E. Niemeyer*	**1C18:** Comparison of raw and torrefied healthy and beetle kill pine in co-combustion with coal *A. Howell, E. Beagle, E. Belmont*
6:00	**Reception –** Laramie Historic Railroad Depot 1st & S 1st St, Laramie		

WSS/CI Western States Section/Combustion Institute

Tuesday, 3 October 2017

7:30 – 1:00 **Registration:** University of Wyoming Conference Center Lobby
7:30 – 8:00 **Continental Breakfast:** University of Wyoming Conference Center Lobby

8:00 - 8:05 **Opening Remarks and Announcement:** Prof. Erica Belmont, *University of Wyoming*

8:05 – 9:05 **Plenary Lecture: Dr. Daniel Dietrich, *NASA***
Session Chair: Dr. Fletcher Miller, *University of California San Diego*

9:05 – 9:15	**BREAK**		
	Diagnostics **Salon A** **Session Chair:** B.C. Windom	**Engines** **Salon B** **Session Chair:** D.B. Olsen	**Coal and Biomass II** **Salon C** **Session Chair:** T.H. Fletcher
9:15 – 9:35	**2A01:** Exploring continuous monitoring methods for SO_3 in flue gas conditions *A. Biasioli, Y.-C. Chien, D. Dunn-Rankin*	**2B01:** Investigation of non-ideal gasoline-ethanol vaporization behavior using an ethanol, cyclohexane, and benzene surrogate *S. Burke, M. Ratcliff, R. McCormick, D. Bartholet, B. Windom*	**2C01:** Sub-model fidelity in pulverized coal combustion simulations *C. Dunn, M. Stoellinger*
9:35 - 9:55	**2A02:** Strategy for background-free measurements of high-speed OH in turbulent flames using SLIPI *B. Zhou, J.H. Frank*	**2B02:** Performance of a compression ignition engine fueled with renewable diesel blends produced from hydrothermal liquefaction, fast pyrolysis, and conversion of ethanol to diesel *J. Tryner, K. Albrecht, J. Billing, R.T. Hallen, A.J. Marchese*	**2C02:** Smoldering behavior of compacted sawdust *P.P. Radyjowski, R.H. Bush, J.L. Ellzey*
9:55 - 10:15	**2A03:** Direct comparison of simulated OH fluorescence and experimental results in a non-premixed laminar diffusion coflow flame at high pressure conditions *D. Escofet-Martin, A. Torredemer, Y.-C. Chien, D. Dunn-Rankin*	**2B03:** Crankcase blow-by gas particulate matter characterization and filtration on a John Deere 4.5 l diesel engine *B.D. Rice, J. Tillotson, D.B. Olsen*	**2C03:** Impact of particle properties on radiative heat flux in an oxy-coal reactor *T. Hosler, B. Adams*
10:15 - 10:35	**2A04:** Light extinction based image analysis technique for rotating fluidized beds *Z. Lavrich, Z. Taie, D. Wagner, C. Hagen*	**2B04:** Evaluation of fuel savings for a ship system with variable frequency drives and energy storage using a Cummins QSK50 Tier 4 diesel engine *J. Moothart, D.M. Wise, D.B. Olsen*	**2C04:** CFD simulations of hydropyrolysis *G.D. Baldwin, C.W. Dunn, M. Stoellinger*
10:35 – 10:50	**BREAK**		

	Heterogeneous and Soot **Salon A** **Session Chair:** D.O. Lignell	**Turbulent Flames III** **Salon B** **Session Chair:** M. Stoellinger	**Laminar Flames III** **Salon C** **Session Chair:** K. Seshadri
10:50 – 11:10	**2A05:** Opposed-flow heterogeneous reactor for partial oxidation of methane *Y. Lin, X. Li, M.V. Twigg, W.F. Northrop*	**2B05:** Lagrangian analysis of premixed autoignition in compressible turbulence *C.A.Z. Towery, R. Darragh, A.Y. Poludnenko, P.E. Hamlington*	**2C05:** Impact of acoustic-induced pressure fluctuations on the dynamics of laminar premixed flames *G. Beardsell, G. Blanquart*
11:10 – 11:30	**2A06:** Preliminary analysis of smoldering combustion in cellulose and hemicellulose mixtures *T.C. Mulky, K.E. Niemeyer*	**2B06:** The effect of spray burner outlet configuration, nozzle position and nozzle type on the flame behavior and stability of liquid fuels *R.A. Alsulami, B.C. Windom*	**2C06:** Impact of non-ideal corrections to equation of state, thermodynamics, and chemical kinetics on one-dimensional freely propagating flame structure *S. Yellapantula, J.B. Bell, E. Motheau, M.S. Day, R.W. Grout*
11:30 – 11:50	**2A07:** Effects of fuel composition and packing density on horizontal smoldering propagation *B.D. Smucker, D.A. Cowan, D.L. Blunck*	**2B07:** Nitrogen oxide emissions from reacting jets in vitiated crossflow *M.D. Sirignano, V. Nair, B. Emerson, J. Seitzman, T.C. Lieuwen*	**2C07:** Numerical simulations of a co-flow methane/air flame including ions and excited species under different gravity conditions *C.-F. Lopez-Camara, D. Dunn-Rankin*
11:50 - 12:10	**2A08:** Flame temperature effect on the transition between soot and graphitic carbon products in premixed stagnation flames *J. Camacho*	**2B08:** Effect of stoichiometric mixture fraction on hydrogen edge-flames in a counter-flow burner *Z. Zhou, P.D. Ronney*	**2C08:** Influences of stoichiometry on steadily propagating triple flames in counterflows *P. Rajamanickam, W. Coenen, A.L. Sánchez, F.A. Williams*
12:10 – 12:30	**2A09:** Modeling soot formation from solid complex fuels *A.J. Josephson, E. Hopkins, R.R. Linn, D.O. Lignell*	**2B09:** Transported and presumed joint PDF modeling of turbulent jet flames *V. Jaganath, M. Stoellinger*	**2C09:** A new reduced thermal diffusion model for H and H_2 *J. Schlup, G. Blanquart*
12:30 – 12:50			**2C10:** Thermal explosions in spherical vessels at large Rayleigh numbers *D. Moreno, I. Iglesias, A.L. Sánchez, A. Liñán, F.A. Williams*
12:50	**Adjourn**		