

ISSN 1044-5110

ATSPE2

ATOMIZATION AND SPRAYS

Journal of the International Institutes for Liquid Atomization and Spray Systems

Volume 17

2007

CONTENTS OF VOLUME 17

Number 1

- 1 Unsteady Rans Modeling of Water-Spray Suppression for Large-Scale Compartment Pool Fires
Sam S. Yoon, Ho Young Kim, Paul E. DesJardin, John C. Hewson, Sheldon R. Tieszen, & Thomas K Blanchat
- 47 Trajectory and Momentum Coherence Breakdown of a Liquid Jet in High-Density Air Cross-Flow
Raffaele Ragucci, Alessandro Bellofiore & Antonio Cavaliere
- 71 Edge Instability and Velocity of Liquid Sheets Formed by Two Impinging Jets
Ri Li & Nasser Ashgriz

Number 2

- 99 A Numerical Study on the Effects of Anisotropic Turbulence on the Behaviors of Impinging Sprays
Gwon Hyun Ko & Hong Sun Ryou
- 123 Single-Fluid and Dual-Fluidatomization Methods: Local and Global Spray Quantities
Julian T. Kashdan, Holger Lienemann, & John S. Shrimpton
- 153 Effects of Impingement Conditions on the Characteristics of Mutual Impinging Spray
Gwon Hyun Ko and Hong Sun Ryou
- 171 Steady-State High-Pressure Spray Cooling of High-Temperature Steel Surfaces
R. A. Sharief, G. G. Nasr, & A. J. Yule

Number 3

- 193** Evaporative Diesel Spray Modeling
J. M. Desantes, J. J. López, J. M. García, & J. M. Pastor
- 233** Gasoline Sprays Injected at Different Back Pressures:
Calculations Using Two Atomization Models
**N. B. H. Abdelkarim, S. S. Ibrahim, A. R. Masri,
& G. Wigley**
- 267** Role of Viscosity on Trajectory of Liquid Jets in a Cross-Airflow
M. Birouk, C. O. Iyogun, & N. Popplewell

Number 4

- 289** Electrostatic Effects on Gasoline Direct Injection
in Atmospheric Ambiance
**Eric K. Anderson, Dimitros C. Kyritsis, Antonio P. Carlucci,
& Arturo De Risi**
- 315** A New Model for Turbulent Flows with Large Density Fluctuations:
Application to Liquid Atomization
**François-Xavier Demoulin, and Pierre-Arnaud Beau,
Grégory Blokkeel, Arnaud Mura, & Roland Borghi**
- 347** Characterization of Splash-Plate Atomizers
Using Numerical Simulations
**Mohammad P. Fard, Denise Levesque, Stuart Morrison,
Nasser Ashgriz, & Javad Mostaghimi**

Number 5

- 381** Experimental Study of Coaxial Atomizers Scaling.
Part I: Dense Core Zone
Bertrand Leroux, Olivier Delabroy, & François Lacas
- 409** Experimental Study of Coaxial Atomizers Scaling.
PART II: Diluted Zone
Bertrand Leroux, Olivier Delabroy, & François Lacas
- 431** Choked Flow of a Bubbly Mixture Through an Effervescent
and Flash-Boiling Atomizer: A Theoretical Approach
T. Bar-Kohany, I. Sher, & E. Sher

- 451 A Comparative Rans/Les Study of Transient Gas Jets and Sprays under Diesel Conditions
Mariafrancesca Valentino, Xi Jiang, & Hua Zhao

Number 6

- 473 Drop/Wall Interaction Criteria and Their Applications in Diesel Spray Modeling
Song-Chang Kong
- 501 On the Sheet Breakup of Direct-Injection Gasoline Pressure-Swirl Atomizer Sprays
M. H. Davy & P. W. Loustalan
- 529 Internal and Near-Nozzle Flow of a Pressure-Swirl Atomizer under Varied Fuel Temperature
Seoksu Moon, Choongsik Bae, Essam F. Abo-Serie & Jaejoon Choi
- 551 Transitional Instability of a Pressure-Swirl Atomizer Due to Air-Core Eruption at Low Temperature
Byung-Sung Park, Ho Young Kim, & Sam S. Yoon

Number 7

- 569 A Study of the Flow and Atomization Characteristics of Impinging Diesel Spray on a Chamber Wall
Hyun Kyu Suh, Sung Wook Park, & Chang Sik Lee
- 601 Atomization Behavior and Energy Analysis for a Single Droplet Impinging on a Surface Oscillating with Ultrasonic Frequency
Masataka Arai, Akira Ishii, & Masahiro Saito
- 621 Gasoline Sprays in Uniform Crossflow
J. M. Nouri & J. H. Whitelaw
- 641 A New Solution for an Evaporating Spray in a Shear Layer, Including Downstream Flow Deceleration/Acceleration
D. Katoshevski & J. B. Greenberg

Number 8

- 659** Characteristics of Water Drople Impaction Behavior on a Polished Steel Heated Surface: Part I
S. W. Akhtar, G. G. Nasr, & A. J. Yule
- 683** Characteristics of Water Droplet Impaction Behavior on a Polished Steel Heated Surface: Part II
S. W. Akhtar, G. G. Nasr, & A. J. Yule
- 731** Physical and Mathematical Models of Bio-oil Combustion
Jordan Hristov & Venelin Stamatov

Following page 756:

Title page to Volume 17
Contents of Volume 17
Author Index to Volume 17
Subject Index to Volume 17
Reviewers for Volume 17

AUTHOR INDEX TO VOLUME 17

- Abdelkarim, N. B. H. – 233
Abo-Serie, E. F. – 529
Akhtar, S. W. – 659, 683
Anderson, E. K. – 289
Arai, M. – 601
Ashgriz, N. – 71
Ashgriz, N. – 347
- Bae, C. – 529
Bar-Kohany, T. – 431
Beau, P.-A. – 315
Bellofiore, A. – 47
Birouk, M. – 267
Blanchat, T. K. – 1
Blokkeel, G. – 315
Borghi, R. – 315
- Carlucci, A. P. – 289
Cavaliere, A. – 47
Choi, J. – 529
- Davy, M. H. – 501
De Risi, A. – 289
Delabroy, O. – 381, 409
Demoulin, F.-X. – 315
Desantes, J. M. – 193
DesJardin, P. E. – 1
- Fard, M. P. – 347
- García, J. M. – 193
Greenberg, J. B. – 641
- Hewson, J. C. – 1
Hristov, J. – 731
- Ibrhim, S. S. – 233
Ishii, A. – 601
Iyogun, C. O. – 267
- Jiang, X. – 451
- Kashdan, J. T. – 123
Katoshevski, D. – 641
Kim, H. Y. – 1, 551
Ko, G. H. – 99, 153
Kong, S.-C. – 473
Kyritsis, D. C. – 289
- Lacas, F. – 381, 409
Lee, C. S. – 569
Leroux, B. – 381, 409
Levesque, D. – 347
Li, R. – 71
Lienemann, H. – 123
López, J. J. – 193
Loustalan, P. W. – 501
- Masri, A. R. – 233
Moon, S. – 529
Morrison, S. – 347
Mostaghimi, J. – 347
Mura, A. – 315
- Nasr, G. G. – 171, 659, 683
Nouri, J. M. – 621
- Park, B.-S. – 551
Park, S. W. – 569
Pastor, J. M. – 193
Popplewell, N. – 267

Ragucci, R. – 47
Ryou, H.S. – 99, 153

Saito, M. – 601
Sharief, R. A. – 171
Sher, E. – 431
Sher, I. – 431
Shrimpton, J. S. – 123
Stamatov, V. – 731
Suh, H. K. – 569

Tieszen, S. R. – 1
Valentino, M. – 451

Whitelaw, J. H. – 621
Wigley, G. – 233

Yoon, S. S. – 1, 551
Yule, A. J. – 171, 659, 683

Zhao, H. – 451

SUBJECT INDEX TO VOLUME 17

A

Aerodynamic effect, 381
Air-assisted injection, 123
Air core, 551
Air cross flow, 47
ALSTOM splash plate, 347
Ambient pressure, 473
Anisotropic turbulence, 99
Atmospheric ambience, 289
Atomizers, 501, 551
Axial penetration, 123
Axisymmetric gas jets, 451

B

Back pressure, 501
Backlight illumination, 193
Beadlike formations, 71
Bio-oil droplet combustion, 731
Blobs, 315
BLspray, 347
Breakup models, 233, 501

C

Capillary instability, 409
Charged sprays, 289
Coaxial injection, 381
Coaxial injectors, 381, 409
Crossflow, 621

D

Dense core zone, 381
Dense core zone properties, 381
Diameter ratio, 409
Diesel
 engine, 193, 473

fuel, 193

sprays, 99, 473

Direct-injection

 process, 233

 spark-ignition, 123

DISI engines, 123

Doppler particle

 anemometer, 153, 621

 analyzer, 569

Droplet

 arithmetic mean diameter, 123

 diameter, 569

 mean velocity, 621

 size, 569

 velocity, 171

Drop wall interaction, 473

Durbin model, 99

E

Edge instability, 47

Electrostatic effects, 289

Empirical correlation, 47, 267, 381

Ethanol, 601

Evaporation, 193

F

Fiber mode, 409

Fire plume, 1

Flash boiling effect, 529

Fluid velocity, 47

Flux, 171

Frop/wall interaction, 473

G

Gas density, 123

Gasoline engines, 621

Gas phase combustion, 1
Glycerin, 601

H

Heat, 171
High density ratio, 315
High piston surface temperature, 473
High-pressure swirl injection, 123
Hollow cone sprays, 233,
289, 501, 551
Hot spray test rig, 193
Hydrodynamic parameters, 683

I

Impinge
 angles, 153
 distance, 153
 spray, 99, 569
Impingement, 601
Inertial force, 289
Injection pressure, 153

J

Jet
 bending, 47
 evolution, 47
 fuel, 551
 momentum, 47
 trajectory, 267

K

Kerosene, 47
Kerosene based aviation fuel, 551

L

Laidenfrost temperature, 473
Langrangian approach, 315
Large eddy simulation, 451
Lee and Ryou model, 99
Liquid
 core length, 381
 film model, 529

jet, 347
sheets, 71
viscosity, 267

M

Mass flow rate, 431
Mass flux, 683
Mean droplet size, 569
Momentum flux, 381
Momentum flux ratio, 267, 409

N

Near-nozzle flows, 529
Nonevaporative spray model, 193
Nozzle
 angle, 347
 diameter, 267, 347
 geometry, 501
 velocity, 347
Nucleate boiling, 473
Nusselt number, 171

O

Offset nozzle geometries, 501

P

Particle image velocimetry, 569
PDA measurements, 289
Phase Doppler anemometer, 621
Phase Doppler particle analyzer, 569
Pressure swirl atomizer, 551
Primary breakup, 315

R

Radial mean velocity, 569
Rayleigh instability, 381
Reatomized droplets, 659
Reynolds averaged
 Navier-Stokes formulation, 1, 451
Reynolds number, 381, 409, 473
Rocket engine, 381, 409

S

Sauter mean diameter, 99, 153, 601
Slip ratio, 431
Solid cone sprays, 153, 551
Splash plate nozzle, 347
Splash-plate atomizers, 347
Spray angle, 381
Spray morphology, 289
Spray wall interactions, 99
Stainless steel surface, 659, 683
Steel making, 171
Stefan boundary, 731
Stokes number, 641
Subsonic cross air flow, 267
Superpulsating mode, 409
Surface wave breakup, 233
Swirl injection system, 123
Swirl motion 529

T

Ttangential velocities, 99

Taylor analogy breakup, 233
Turbulent flow, 315
Turbulent liquid flux, 315
Two phase flow, 431

U

Ultrasonic
atomization, 601
frequency, 601

V

Velocity 315, 431
Viscosity, 267

W

Wall film, 473
Wwater-spray, 1
Water-spray cooling, 171
Weber number, 47, 409,
473, 659, 683
Wind tunnel, 267