

Index to Volume 13, 1992

Author/Title Index

- Ahmed, S. A.: *See* Nejad, A. S., 314
- Ahmed, S. A. and Nejad, A. S.: Premixed, turbulent combustion of axisymmetric sudden expansion flows, 15
- Ahn, K. H. and Ibrahim, M. B.: Laminar/turbulent oscillating flow in circular pipes, 340
- Alam, S. S.: *See* Ali, H., 86
- Ali, H. and Alam, S. S.: Circulation rates in thermosiphon reboiler, 86
- Anagnostopoulos, J. S. and Bergeles, G. C.: Discrete-phase effects on the flow field of a droplet-laden swirling jet with recirculation: A numerical study, 141
- Andresen, B. and Gordon, J. M.: Optimal paths for minimizing entropy generation in a common class of finite-time heating and cooling processes, 294
- Arnal, M. P., Goering, D. J., Humphrey, J. A. C.: Unsteady laminar flow developing in a curved duct, 347
- Aung, W.: *See* Jen, Y. N., 329
- Balasubramaniam, R.: *See* Dill, L. H., 78
- Baliga, B. R.: *See* Bernier, M. A., 241
- Bejan, A.: *See* Lage, J. L., 408; Lim, J. S., 71
- Bergeles, G. C.: *See* Anagnostopoulos, J. S., 141; Trifonopoulos, D. A., 151
- Bernier, M. A. and Baliga, B. R.: Visualization of upward mixed-convection flows in vertical pipes using a thin semitransparent gold-film heater and dye injection, 241
- Button, B. L.: *See* Jambunathan, K., 106
- Campo, A. and Pericchi, L. R.: Statistical assessment of total heat losses from externally finned tubes using various spatially weighted mean Biot numbers, 399
- Carrington, C. G. and Sun, Z. F.: Second law analysis of combined heat and mass transfer in internal and external flows, 65
- Chan, S. K. and Woods, W. A.: On Rayleigh and Fanno flows of homogeneous equilibrium two-phase fluids, 273
- Chen, J. L.: *See* Jeng, Y. N., 329
- Chen, S.-J., Tseng, A. A.: Spray and jet cooling in steel rolling, 358
- Choi, H. K. and Park, S. O.: Laminar entrance flow in curved annular ducts, 41
- Chou, F. C.: *See* Lin, J. N., 250
- Collins, M. W. and Stasiek, J.: The application of a transformational zone method to the calculation of radiation heat transfer inside a piston-cylinder system, 380
- Desai, C. and Vafai, K.: Three-dimensional buoyancy-induced flow and heat transfer around the wheel outboard of an aircraft, 50
- Dill, L. H. and Balasubramaniam, R.: Unsteady thermocapillary migration of isolated drops in creeping flow, 78
- Douglas, W. J. M.: *See* Saad, N. R., 2
- Farge, T. Z. and Johnson, M. W.: Effect of flow rate on loss mechanisms in a backswep centrifugal impeller, 189
- Filipovic, I.: *See* Yule, A. J., 197
- Fujita, H.: *See* Hirota, M., 22
- Fusegi, T., Hyun, J. M., and Kuwahara, K.: Numerical simulations of natural convection in a differentially heated cubical enclosure with a partition, 176
- Georgiadis, J. G.: *See* Lage, J. L., 408
- Glakpe, E. K.: *See* Rao, Y. F., 97
- Goering, D. J.: *See* Arnal, M. P., 347
- Gordon, J. M.: *See* Andresen, B., 294
- Gorla, R. S. R.: *See* Lee, J. K., 259
- Grald, E. W. and MacArthur, J. W.: A moving-boundary formulation for modeling time-dependent two-phase flows, 266
- Guedes, R. O. C. and Ozisik, M. N.: Conjugated turbulent heat transfer with axial conduction in wall and convection boundary conditions in a parallel-plate channel, 322
- Hasan, M. A. Z. and Khan, A. S.: On the instability characteristics of a reattaching shear layer with nonlaminar separation, 224
- Hashemi-Esfahanian, A.: *See* Molki, M., 116
- Hirota, M., Yokosawa, H., and Fujita, H.: Turbulence kinetic energy in turbulent flows through square ducts with rib-roughened walls, 22
- Huang, L. J. and Shah, R. K.: Assessment of calculation methods for efficiency of straight fins of rectangular profile, 282
- Humphrey, J. A. C.: *See* Arnal, M. P., 347
- Hyun, J. M.: *See* Fusegi, T., 176
- Ibrahim, M. B.: *See* Ahn, K. H., 340
- Jambunathan, K., Lai, E., Moss, M. A., and Button, B. L.: A review of heat transfer data for single circular jet impingement, 106
- Jeng, Y. N., Chen, J. L. and Aung, W.: On the Reynolds-number independence of mixed convection in a vertical channel subjected to asymmetric wall temperatures with and without flow reversal, 329
- Johnson, A. R. and Morris, W. D.: An experimental investigation into the effects of rotation on the isothermal flow resistance in circular tubes rotating about a parallel axis, 132
- Johnson, M. W.: *See* Farge, T. Z., 189
- Khan, A. S.: *See* Hasan, M. A. Z., 224
- Kim, J. H.: *See* Lim, J. S., 71
- Krishna Murthy, M. V.: *See* Rao, K. V. N., 300
- Kuwahara, K.: *See* Fusegi, T., 176
- Lage, J. L., Bejan, A. and Georgiadis, J. G.: The Prandtl number effect near the onset of Benard convection in a porous medium, 408
- Lai, E.: *See* Jambunathan, K., 106
- Lai, J. C. S.: Turbulence suppression in an elliptic jet, 93
- Lasher, W. C. and Taulbee, D. B.: On the computation of turbulent backstep flow, 30
- Launder, B. E. and Loizou, P. A.: Laminarization of three-dimensional accelerating boundary layers in a curved rectangular-sectioned duct, 124
- Lee, J. K. and Gorla, R. S. R., Pop, I.: Natural convection to power-law fluids from a heated vertical plate in a stratified environment, 259
- Lee, S.-Y.: *See* Tsui, Y.-Y., 232
- Ligrani, P. M.: *See* Subramanian, C. S., 210
- Lim, J. S., Bejan, A. and Kim, J. H.: Thermodynamics of energy extraction from fractured hot dry rock, 71
- Lin, J. N., Tzeng, P. Y., Chou, F. C., Yan, W. M.: Convective instability of heat and mass transfer for laminar forced convection in the thermal entrance region of horizontal rectangular channels, 250
- Loizou, P. A.: *See* Lander, B. E., 124
- MacArthur, J. W.: *See* Grald, E. W., 266
- Mehta, J. M.: Analysis of double-diffusive convection with temperature modulations at the boundaries, 160
- Molki, M. and Hashemi-Esfahanian, A.: Turbulent convective mass transfer downstream of a perforated baffle blockage, 116
- Morris, W. D.: *See* Johnson, A. R., 132
- Moss, M. A.: *See* Jambunathan, K., 106
- Narasimham, G. S. V. L.: *See* Rao, K. V. N., 300
- Nejad, A. S.: *See* Ahmed, S. A., 15
- Nejad, A. S. and Ahmed, S. A.: Flow-field characteristics of an axisymmetric sudden-expansion pipe flow with different initial swirl distribution, 314
- Ozisik, M. N.: *See* Guedes, R. O. C., 322
- Park, S. O.: *See* Choi, H. K., 41
- Pericchi, L. R.: *See* Campo, A., 399
- Polat, S.: *See* Saad, N. R., 2
- Poots, G. and Skelton, P. L. I.: Rime- and glaze-ice accretion due to freezing rain falling vertically on a horizontal thermally insulated overhead line conductor, 390
- Pop, I.: *See* Lee, J. K., 259
- Rao, K. V. N., Narasimham, G. S. V. L., and Krishna Murthy, M. V.: Analysis of co-current hydraircooling of food products in bulk, 300
- Rao, Y. F. and Glakpe, E. K.: Natural convection in a vertical slot filled with porous medium, 97
- Rehbinder, G.: Thermally induced flow of two immiscible stratified liquids in a porous body at a low Rayleigh number, 168
- Saad, N. R., Polat, S. and Douglas, W. J. M.: Confined multiple impinging slot jets without crossflow effects, 2
- Sawchuk, S. P. and Zamir, M.: Boundary layer on a circular cylinder in axial flow, 184
- Shah, M. M.: A survey of experimental heat transfer data for nucleate pool boiling of liquid metals and a new correlation, 370
- Shah, R. K.: *See* Huang, L. J., 282
- Skelton, P. L. I.: *See* Poots, G., 390
- Stasiek, J.: *See* Collins, M. W., 380
- Subramanian, C. S., Ligrani, P. M. and Tuzzolo, M. F.: Surface heat transfer and flow properties of vortex arrays induced artificially and from centrifugal

instabilities, 210
 Sun, Z. F.: *See* Carrington, C. G., 65
 Taulbee, D. B.: *See* Lasher, W. C., 30
 Trifonopoulos, D. A. and Bergeles, G. C.:
 Stable stratification effects on the flow
 past surface obstructions: A numerical
 study, 151
 Tseng, A. A.: *See* Chen, S.-J., 358
 Tsui, Y.-Y. and Lee, S.-Y.: Calculation of
 turbulent flow through engine inlet ports,
 232
 Tuzzolo, M. F.: *See* Subramanian, C. S., 210
 Tzeng, P. Y.: *See* Lin, J. N., 250
 Vafai, K.: *See* Desai, C., 50
 Woods, W. A.: *See* Chan, S. K., 273
 Yan, W. M.: *See* Lin, J. N., 250
 Yokosawa, H.: *See* Hirota, M., 22
 Yule, A. J. and Filipovic, I.: On the
 break-up times and lengths of diesel
 sprays, 197
 Zamir, M.: *See* Sawchuk, S. P., 184

Keyword Index

Accelerated flow, 124
 Atomization, 197
 Axisymmetric sudden expansion, 15

Backstep flow, 30
 Benard convection, 408
 Boiling, 358, 370
 Boiling incipience, 86
 Boundary layer, 184
 Boussinesq approximation, 151

Centrifugal compressor, 189
 Centrifugal instability, 210
 Compact heat exchanger, 282
 Computational fluid dynamics, 340
 Convective instability, 250
 Convective mass transfer, 116
 Cooling, 358
 Correlation, 370
 Creeping flow, 78
 Critical Reynolds number, 340
 Critical speeds, 273
 Curved annulus, 41
 Curved duct, 347
 Curved ducts, 124
 Cylinder, 184

3-D flow, 189
 Diesel injection, 197
 Direct numerical simulation, 176
 Double-diffusive convection, 160
 Droplet-laden, 141
 Drops, 78
 Duct flow, 22
 Dump combustor, 314

Elliptic jet, 93
 Embedded vortices, 210
 Engine inlet port, 232

Entropy generation, 65, 294
 Evaporator, 266
 Experimental, 15
 Externally finned tubes, 399
 Fanno, 273
 Fin efficiency, 282
 Finite difference, 358
 Finite-difference method, 176
 Finite differences, 151
 Finite element, 50
 Finite-time thermodynamics, 294
 Finite-volume method, 232, 329
 Flow over three-dimensional hill, 151
 Flow resistance, 132
 Flow visualization, 241
 Forced convection correlation, 106
 Free shear layer, 224
 Freezing rain, 390
 Fuel sprays, 197
 Gas turbines, 132
 Generalized integral transform technique,
 322
 Geothermal energy, 71
 Goertler vortices, 347
 Gold-film heater, 241

Half cooling time, 300
 Heat and mass transfer, 250
 Heat exchange, 294
 Heat pump, 266
 Heat transfer, 2, 65, 370
 Heat-transfer correlation, 97
 Heat transfer measurement, 358
 Homogeneous equilibrium two-phase, 273
 Hot dry rock, 71
 Hydraircooling, 300

Initial condition, 224
 Instability, 93
 Installed capacity, 294
 Internal flow, 41

Jet, 141
 Jet impingement, 106

k- ϵ model, 232

Laminar, 50, 347
 Laminar flow, 41
 Laminarization, 124
 Laminar-turbulent transition, 241
 Large-scale structure, 224
 Latent heat transport, 250
 Linear stability analysis, 160
 Liquid column breakup, 197
 Liquid metals, 370
 Losses, 189
 Lumped-parameter model, 399

Mass transfer, 65
 Mathematical model, 266
 Mean Biot numbers, 399
 Microgravity, 78
 Mixed-convection, 241, 329
 Moving boundary, 266

Natural convection, 50, 97, 259, 370
 Natural convection in enclosures, 176
 Newtonian fluids, 78
 Non-Newtonian fluids, 259
 Nucleate, 370
 Numerical, 141

Open end boundary, 50
 Optimal control, 294
 Oscillating flows, 340
 Overhead power conductors, 390

Perforated blockage, 116
 Piston-cylinder system, 380
 Pool, 370
 Porous media, 168, 408
 Porous medium, 97
 Power-law fluids, 259
 Prandtl number effect, 408
 Precooling technique, 300
 Premixed, 15

Radiation heat transfer, 380
 Rayleigh, 273
 Reattaching shear layer, 224
 Recirculating flow, 116
 Recirculation, 141, 314
 Recirculation cells, 241
 Rheology, 259
 Rib-roughness element, 22
 Rolling, 358

Secondary flow, 41, 189
 Secondary flow of the second kind, 22
 Second law analysis, 65, 71
 Separation, 224
 Shear-layer instability, 224
 Single and multiple impinging jets, 2
 Solar ponds, 160
 Square duct, 22
 Stable stratification, 151
 Steel, 358
 Step mode of instability, 224
 Straight fin, 282
 Stratified flow, 168
 Submergence, 86
 Swirl, 141
 Swirling, 314

Theoretical analysis, 380
 Thermal convection, 168
 Thermal entrance region, 250
 Thermal entry region, 322
 Thermocapillary flow, 78
 Thermosiphon, 86
 Three-dimensional, 50
 Transformational zone method, 380
 Transient flow, 78
 Turbomachines, 132
 Turbulence, 2
 Turbulence kinetic energy, 22
 Turbulence modeling, 30, 151
 Turbulence suppression, 93
 Turbulent, 314
 Turbulent combustion, 15
 Turbulent duct flow, 116
 Turbulent flow, 22, 106, 124, 232
 Turbulent modeling, 340
 Two-phase flow, 266

Unsteady, 347
 Unsteady flows, 340
 Unsteady turbulent calculations, 30

Vertical slot, 97
 Viscous flow, 184
 Vortex array, 210
 Vortex spacing, 210

Water jet, 358
 Water spray, 358