

HEAT TRANSFER BIBLIOGRAPHY

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APPLICATIONS

- H. E. ANDERSEN, Investigations of the heat transmission and the stirring performance in a stirring vessel with boundary layer and blade agitators (in German), *Z. Ver. Dt. Ing.* **107**, No. 19, 825 (1965).
- B. H. ANDERSON and R. L. DANILOWICZ, Analytical and experimental study of nuclear heating of liquid hydrogen, NASA TN D-2934 (1965).
- V. M. BIMAN, Some problems in the designing of super-powerful single-pass boilers, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio in its *Heat Power Engng*, p. 1, June (1965).
- A. G. BOGANOV, YU. A. PIROGOV and L. P. MAKAROV, Investigation of the effective thermal conductivity and total emissivity of heat-resistant ceramic coatings of refractory oxides produced by gas-flame spraying, *High Temperature* **3**, No. 1, 53 (1965).
- J. L. BOYEN, Total energy: A problem in heat recovery, *Mech. Engng* **87**, No. 10, 32 (1965).
- G. W. CARTER, Infrared heat-transfer engineering, *J. Electron. Packag. Prod.* **5**, No. 9, 34 (1965).
- C. J. CREMERS and E. R. G. ECKERT, Temperature field in an arc with a transpiration-cooled anode, *AIAA J/3*, No. 10, 1876 (1965).
- W. DRUMMOND and W. RHIND, Waste heat recovery, *Chem. Process Engng* **46**, No. 8, 461 (1965).
- L. E. ERICSSON and J. P. REDING, Analysis of flow separation effects on the dynamics of a large space booster, *J. Spacecraft Rockets* **2**, No. 4, 481 (1965).
- J. P. FANARITIS and J. D. KIMMEL, Review of once-through steam generators, *J. Petrol. Technol.* **17**, No. 4, 409 (1965).
- G. F. FONSECA and A. H. WOODCOCK, Local heat transfer coefficients of laboratory facial protective systems in wind, *Text. Res. J.* **35**, No. 10, 909 (1965).
- W. L. FRANCIS, Experimental heat-transfer study of shock impingement on fins in hypersonic flow, *J. Spacecraft Rockets* **2**, No. 4, 630 (1965).
- F. B. GESSNER, J. D. SEADER, R. J. INGRAM and T. A. COULTAS, Analysis of self-cooling with infiltrated porous tungsten composites, *J. Spacecraft Rockets* **1**, No. 6, 643 (1964).
- R. GREGORIG, Energieverluste der Wärmeausstauscher. Part 3. Energieverluste durch Mischung, *Chemie-Ingr-Tech.* **37**, No. 9, 956 (1965).
- H. C. HALLER, S. LIEBLEIN and B. G. LINDOW, Analysis and evaluation of a vapor-chamber fin-tube radiator for high-power rankine cycles, NASA TN D-2836 (1965).
- J. A. HART and E. SZOMANSKI, Development of the cyclic method of heat transfer measurement of Lucas Heights, *Mech. Chem. Engng Trans., Australia MC* **1**, No. 1, 1 (1965).
- R. W. HORTON, Boilers in the process industries, *Chem. Process Engng* **46**, No. 8, 451 (1965).
- J. HULTBERG, Heating-cooling time for a planetary lander survival payload, Jet Propulsion Lab., California Institute of Technology, Pasadena (1965).
- R. W. JEFFERY, Infrared heaters for thermoforming, *Mod. Plast.* **42**, No. 12, 103 (1965).
- G. E. KAATTARI, The effect of simulated ablation-gas injection on the shock layer of blunt bodies at Mach numbers of 3 and 5, NASA TN D-2954 (1965).
- A. M. KARAPETYAN, A study of the heat transfer coefficients of modular electronic equipment, Joint Publications Research Service, Washington, D.C. (1965).
- W. R. KERSLAKE and E. E. DANGLE, Tests with hydrogen fuel in a simulated afterburner (declassified), *NACA-RM-E56D13a*, Lewis Research Center, NASA, Cleveland, Ohio (1956).
- N. P. KLITIN and V. A. LOKSHIN, Heat transmission and distance of longitudinally finned tubes, *Thermal Engng* **11**, No. 5, 102 (1964).
- A. M. LLOYD, J. A. W. MACINTOSH and W. Z. PADUCH, Economics of process heating with organic heat transfer media, *Chem. Process Engng* **46**, No. 8, 445 (1965).
- J. H. LUNDELL, R. M. WAKEFIELD and J. W. JONES, Experimental investigation of a charring ablative material exposed to combined convective and radiative heating, *AIAA J/3*, No. 11, 2087 (1965).
- A. J. MORTLOCK, Experiments with a thermoelectric heat pump, *Am. J. Phys.* **33**, No. 10, 813 (1965).
- G. NIEMANN and G. LECHNER, The measurement of surface temperature on gear teeth, *J. Bas. Engng* **87**, No. 3, 641 (1965).
- A. D. PUNCHEVSKII, On the transfer functions of technical heat receivers (in Russian), *Izmerit. Tekh.*, No. 5, 23 (1965).
- G. F. S. REISING, Dust suspension—a novel heat transfer medium, *Chem. Process Engng* **46**, No. 8, 436 (1965).
- R. J. ROSA, Liquid to gas heat transfer in a nuclear reactor, *AIAA J/3*, No. 8, 1516 (1965).
- A. SATTER, Heat losses during flow of steam down a wellbore, *J. Petrol. Technol.* **17**, No. 7, 845 (1965).
- A. V. SAULE, R. P. KREBS and B. M. AUER, Design analysis and general characteristics of flat-plate central-fin-tube sensible-heat space radiators, NASA TN D-2839 (1965).

- F. SCHULENBERG, Wahl der Bezugslänge zur Darstellung von Wärmeübergang und Druckverlust in Wärmeustauschern, *Chemie-Ingr-Tech.* **37**, No. 8, 799 (1965).
- F. E. SCHULTZ and P. B. CLINE, Analytical comparisons of ablative nozzle materials, NASA CR-54257, Re-entry Systems Dept., General Electric Co., Philadelphia, Pa. (1964).
- J. F. SKRIVAN and W. VON JASKOWSKY, Heat transfer from plasmas to water-cooled tubes. Engineering correlations, *I/EC Process Des. Dev.* **4**, No. 4, 271 (1965).
- A. G. SMITH, T. A. CARBERRY and R. M. HOUSTON, Heat transfer at low temperature in the entry section of a solid propellant, *J. Br. Interplanet. Soc.* **20**, No. 3, 79 (1965).
- J. STARCZEWSKI, Generalized design of evaporators: heat transfer to nucleate boiling liquids, *Br. Chem. Engng* **10**, No. 8, 523 (1965).
- L. STRAND, Arc-imaging furnace ignition test facility, Jet Propulsion Lab., California Institute of Technology, Pasadena (1965).
- F. STREK, S. MASIUK, G. GAWOR and R. JAGIELLO, Heat transfer in mixers for liquids (studies of propeller agitators), *Int. Chem. Engng* **5**, No. 4, 695 (1965).
- F. TREFNY, Wärmeaustausch bei beliebiger Stromart. Part 3: Eine allgemeine Gleichung zum vereinfachten Berechnen von Wärmeaustauscher-Kombination, *Chemie-Ingr-Tech.* **37**, No. 8, 835 (1965).
- J. WARNER and J. W. TELFORD, A check of aircraft measurements of vertical heat flux, *J. Atmos. Sci.* **22**, No. 4, 463 (1965).
- J. P. WEIDNER and J. M. CUBBAGE, Base pressures and convective heat-transfer coefficients for clustered sonic nozzles with emphasis on choked exhaust backflow, NASA TN D-2929 (1965).
- A. R. WILLIS, A computer program for predicting aerodynamic heating on sharp cones, *SCL-Tm-64-87*, Sandia Corp., Livermore, Calif. (1964).
- E. L. WILSON and Z. ZUKERMAN, Thermal strain analysis of advanced manned spacecraft heat shields, NASA CR-65063, Von Karman Center, Aerojet-General Corp., Azusa, Calif. (1964).
- F. WOLF and J. SPIEGEL, Analysis of equilibrium shock-layer radiation for atmospheric entry to Mars, Jet Propulsion Lab., California Institute of Technology, Pasadena (1965).
- D. BETTERMANN, Contribution à l'étude de la couche limite turbulente le long de plaques rugueuses, Rapport No. 65-6, Faculté des Sciences de Paris, Centre National de la Recherche Scientifique, Laboratoire d'Aérothermique, 4 ter. Route des Gardes, Paris, France (1965).
- R. CHAND and H. F. ROSSON, Local heat flux to water film flowing down a vertical surface, *I/EC Fundamentals* **4**, No. 3, 356 (1965).
- W. CHINITZ and L. SPADACCINI, Heat transfer due to combustion on a flat plate in supersonic flow, *GASL-TR-486*, General Applied Sciences Labs., Inc., Westbury, N.Y. (1965).
- T. K. FANNELÖP and I. FLÜGGE-LORTZ, Two-dimensional hypersonic stagnation flow at low Reynolds numbers, *Z. Flugwiss.* **13**, No. 8, 282 (1965).
- W. D. HAYES, Inviscid rotational stagnation point flow, *J. Appl. Math. Mech.* **28**, No. 4, 840 (1964).
- G. HETSRONI, C. W. HALL and A. M. DHANAK, Momentum transfer in thermally asymmetric turbulent jets, *J. Heat Transfer* **87**, No. 4, 429 (1965).
- R. D. HUGELMAN, Application of Pohlhausen's method of stagnation-point flow, *AIAA Jl 3*, No. 11, 2158 (1965).
- B. L. HUNT and M. SIBULKIN, Approximate expression for the boundary-layer shape factor, *AIAA Jl 3*, No. 11, 2159 (1965).
- G. E. KAATTARI, The effect of simulated ablation-gas injection on the shock layer of blunt bodies at Mach numbers of 3 and 5, NASA TN D-2954 (1965).
- V. S. KHOMENKO, On a problem of heat conduction in jets, *J. Appl. Math. Mech.* **28**, No. 5, 1168 (1964).
- YU. A. KOSHMAROV and N. M. GORSKAYA, Heat transfer and equilibrium temperature on a thin plate in hypersonic flow with strong interaction, *Int. J. Heat Mass Transfer* **8**, No. 11, 1415 (1965).
- J. G. MARVIN and C. M. AKIN, Pressure and convective heat-transfer measurements in a shock tunnel using several test gases, NASA TN D-3017 (1965).
- I. N. MURZINOV, On heat exchange at critical point of a blunt body at small Reynolds numbers, *J. Appl. Mech. Tech. Phys.*, p. 229 (1965).
- S. V. NARDO and J. E. FLAHERTY, Ablation of hollow cylinders, *PIBAL-907*, Dept. of Aerospace Engineering and Applied Mechanics, Polytechnic Institute of Brooklyn, N.Y. (1965).
- T. J. O'CONNOR, E. H. COMFORT and L. A. CASS, Turbulent mixing of axisymmetric jets of partially dissociated nitrogen with ambient air, *RAD-TR-65-18*, Research and Advanced Development Div., AVCO Corp., Wilmington, Mass. (1965).
- S. OSTRACH and D. G. McCONNELL, Melting ablation about decelerating spherical bodies, *AIAA Jl 3*, No. 10, 1883 (1965).
- P. H. ROSE and J. O. A. STANKEVICS, Heat-transfer measurements in partially ionized air, *AIAA Jl 3*, No. 9, 1623 (1965).
- S. G. RUBIN, Incompressible flow along a corner. Part I. Boundary-layer solutions and formulation of corner-layer problem, *PIBAL-876*, Dept. of Aerospace Engineering and Applied Mechanics, Polytechnic Institute of Brooklyn, N.Y. (1965).
- G. N. SARMA, Unified theory of the solutions of the unsteady

BOOKS

- V. M. BORISHANSKII, editor, *Liquid Metals*. Collection of Articles, *AEC-TR-6554*, Div. of Technical Information, Atomic Energy Commission, Washington, D.C. (1965).
- W. M. ROHSENOW, editor, *Developments in Heat Transfer*. Edward Arnold, London (1964).

BOUNDARY-LAYER FLOW

- E. W. ADAMS and B. K. BERRY, The stationary laminar velocity boundary layer with constant fluid properties and arbitrary distributions of pressure and mass transfer, NASA TN D-2642 (1965).
- H. BEER, Wärmeübertragung in dissoziierenden Gasen, *Chemie-Ingr-Tech.* **37**, No. 10, 1047 (1965).

- S. G. RUBIN, Incompressible flow along a corner. Part I. Boundary-layer solutions and formulation of corner-layer problem, *PIBAL-876*, Dept. of Aerospace Engineering and Applied Mechanics, Polytechnic Institute of Brooklyn, N.Y. (1965).
- G. N. SARMA, Unified theory of the solutions of the unsteady

- thermal boundary-layer equation, *Proc. Camb. Phil. Soc. Math. Phys. Sci.* **61**, Part 3, 809 (1965).
- D. S. SASTRI, Heat transfer in the presence of temperature dependent heat sources in the flow over a flat plate with suction, *J. Phys. Soc. Japan* **20**, No. 9, 1611 (1965).
- E. U. SCHLUNDER and D. GROHNE, Wärmeübergang von einer ebenen Wand an gasförmige Medien, *Chemie-Ingr.-Tech.* **37**, No. 8, 811 (1965).
- W. E. SUMMERS, Real-gas laminar boundary layers in hypersonic nozzles, *AEDC-TR-65-217*, Propulsion Wind Tunnel Facility, Arnold Engineering Development Center, Air Force Systems Command, Arnold Air Force Station, Tenn. (1965).
- W. TOLLE, Theoretical boundary layer investigations of the problem of heat exchange in cocurrent and counter-current flow (in German), *Z. Ver. Dt. Ing.* **107**, No. 19, 825 (1965).
- R. W. TRUITT, Hypersonic turbulent boundary-layer interference heat transfer in vicinity of protuberances, *AIAA Jl 3*, No. 9, 1754 (1965).
- R. E. WILSON, Laminar boundary-layer growth on slightly blunted cones at hypersonic speeds, *J. Spacecraft Rockets* **2**, No. 4, 490 (1965).
- ### CHANGE OF PHASE
- J. A. ALBERS and R. P. MACOSKO, Experimental pressure-drop investigation of non-wetting, condensing flow of mercury vapor in a constant-diameter tube in 1-G and zero-gravity environments, *NASA TN D-2838* (1965).
- G. I. BOBROVICH and N. N. MAMONTOV, A study of the mechanism of nucleate boiling at high heat fluxes, *Int. J. Heat Mass Transfer* **8**, No. 11, 1421 (1965).
- V. M. BORISHANSKIY and B. S. FOKIN, Correlation of heat transfer data in stable film boiling on vertical surfaces in the presence of free liquid connection in large volumes, *Int. Chem. Engng* **5**, No. 4, 666 (1965).
- R. A. S. BROWN, The mechanics of large gas bubbles in tubes. I. Bubble velocities in stagnant liquids, *Can. J. Chem. Engng* **43**, No. 5, 217 (1965).
- R. A. S. BROWN and G. W. GOVIER, The mechanics of large gas bubbles in tubes. II. The prediction of voidage in vertical gas-liquid flow, *Can. J. Chem. Engng* **43**, No. 5, 224 (1965).
- J. C. CHATO, Condensation in a variable acceleration field and the condensing thermosyphon, *J. Engng Fwr* **87**, No. 4, 355 (1965).
- F. A. CHEEVES, R. G. DRESSIER and W. C. McGAVOCK, Evaporation suppression by monolayers on aqueous saline solutions, *Ind. Engng Chem.* **4**, No. 3, 206 (1965).
- T. DORNER JR. and A. E. BERGLES, Pressure drop with surface boiling in small-diameter tubes, *TR-8767-31*, Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge (1964).
- K. W. HALEY and J. W. WESTWATER, Heat transfer from a fin to a boiling liquid, *Chem. Engng Sci.* **20**, No. 7, 711 (1965).
- L. G. HAMBURGER, On the growth and rise of individual vapour bubbles in nucleate pool boiling, *Int. J. Heat Mass Transfer* **8**, No. 11, 1369 (1965).
- S. ISHIGAI, M. YAMANE and K. ROKO, Measurement of the component flows in a vertical two-phase flow by making use of the pressure fluctuation. Part 1, Proposal of a characteristic number, *Bull. J.S.M.E.* **8**, No. 31, 375 (1965).
- S. ISHIGAI, M. YAMANE, K. ROKO, T. TAKAGI and K. TANAKA, Measurement of the component flows in a vertical two-phase flow by making use of the pressure fluctuation. Part 2, The flow model for the slug-flow and its application, *Bull. J.S.M.E.* **8**, No. 31, 383 (1965).
- H. A. KEARSEY, Steam water heat transfer—post-burnout conditions, *Chem. Process Engng* **46**, No. 8, 455 (1965).
- A. A. KUDIRKA, R. J. GROSH and P. W. MCFAADDEN, Heat transfer in two-phase flow of gas-liquid mixtures, *I/EC Fundamentals* **4**, No. 3, 339 (1965).
- S. LIN, The evaluation of the rate of ice forming round a cylindrical pipe including density changes near the ice surface (in German), *Kältetechnik* **17**, No. 5, 138 (1965).
- I. G. MALENKOV, Critical phenomena in processes of bubbling and boiling, *J. Appl. Mech. Tech. Phys.*, No. 6, 292 (1965).
- W. MALEWSKI, Zusammenhang zwischen Stoffübergang und Wellenstruktur beim welligen Rieselfilm, *Chemie-Ingr.-Tech.* **37**, No. 8, 815 (1965).
- A. N. NAHAVANDI and R. F. VON HOLLEN, Two-phase pressure gradients in the approach region to critical flow, *Nucl. Sci. Engng* **22**, No. 4, 463 (1965).
- A. P. ORNATSKII, L. F. GLUSHCHENKO and V. A. CHERNORAI, On the effect of pressure on head losses during surface boiling, *High Temperature* **2**, No. 6, 821 (1964).
- S. OSTRACH and A. KOESTEL, Film instabilities in two-phase flow, *A.I.Ch.E. Jl* **11**, No. 2, 294 (1965).
- P. A. PAVLOV and V. P. SKRIPOV, Boiling of a liquid with pulsed heating, *High Temperature* **3**, No. 1, 97 (1965).
- R. H. PLETCHER and H. N. McMANUS JR., An analytical study of film behavior in horizontal annular two-phase flows, *AROD-3199-1*, Sibley School of Mechanical Engineering, Cornell University, Ithaca, N.Y. (1965).
- A. A. POURING, Thermal choking and condensation in nozzles, *Physics Fluids* **8**, No. 10, 1802 (1965).
- T. W. F. RUSSELL and D. E. LAMB, Flow mechanism of two-phase annular flow, *Can. J. Chem. Engng* **43**, No. 5, 237 (1965).
- F. L. SCHWARTZ and L. G. SILER, Correlation of sound generation and heat transfer in boiling, *J. Heat Transfer* **87**, No. 4, 436 (1965).
- R. SIEGEL and E. G. KESHOCK, Nucleate and film boiling in reduced gravity from horizontal and vertical wires, *NASA TR R-216* (1965).
- K. O. SOLBERG, P. BAKSTAD and J. RAMUSSEN, A steady state FORTRAN code for the hydraulics of a boiling loop, *KR-85*, Institut for Atomenergi, Kjeller, Norway (1965).
- A. H. STENNING and T. N. VEZIROGLU, Boiling flow instability, *NASA CR-64319*, Mechanical Engineering Department, Miami University, Coral Gables, Fla. (1965).
- K. SUBBARAYA and N. R. KULLOOR, Studies on evaporation in still air, *Indian J. Technol.* **3**, No. 8, 235 (1965).
- M. SUO, A. E. BERGLES, E. F. DOYLE, L. CLAWSON and P. GOLDBERG, Investigation of boiling flow regimes and critical heat flux, Dynatech-517; *NYO-3304-3*, Dynatech Corp., Cambridge, Mass. (1965).
- J. S. TURTON, Geometrical similarity in saturated pool boiling, *Int. J. Heat Mass Transfer* **8**, No. 11, 1425 (1965).

- G. B. WALLS, D. A. STEEN and J. M. TURNER, Two-phase flow and boiling heat transfer, *NYO-3114-3*, Thayer School of Engineering, Dartmouth College, Hanover, N.H. (1964).
- N. ZUBER and J. A. FINDLAY, Average volumetric concentration in two-phase flow systems, *J. Heat Transfer* **87**, No. 4, 453 (1965).

CHANNEL FLOW

- A. E. BERGLES and P. H. NEWELL JR., The influence of ultrasonic vibrations on heat transfer to water flowing in annuli, *Int. J. Heat Mass Transfer* **8**, No. 10, 1273 (1965).
- M. E. ERDOGAN, Heat transfer in a viscous fluid between two walls with constrictions (in Turkish), Report 17, I.T.U. Mekanik ve Akiskanlar Mekanigi Kursusu, Istanbul O.E.C.D. (1964).
- A. P. GALLAGHER and A. McD. MERCER, On the behavior of small disturbances in plane Couette flow with a temperature gradient, *Proc. R. Soc. A* **286**, No. 1404, 117 (1965).
- J. E. GERRARD, F. E. STEIDLER and J. K. APPLEDOORN, Viscous heating in capillaries. Adiabatic case, *I/EC Fundamentals* **4**, No. 3, 332 (1965).
- J. W. GORESH, Heat transfer in cylindrical pipes with turbulent flow and arbitrary wall flux and temperature distributions, *ARL-65-84*, Aerospace Research Labs., Wright-Patterson AFB, Ohio (1965).
- N. HAYASI and K. INOUYE, Transient heat transfer through a thin circular pipe due to unsteady flow in the pipe, *J. Heat Transfer* **87**, No. 4, 513 (1965).
- G. L. HEATH, An investigation of diffusion of supersonic flows in curved constant area passages, *ARL 65-179*, Office of Aerospace Research, U.S. Air Force, Wright-Patterson AFB, Ohio (1965).
- T. HOBLER and K. KOZIOL, Heat transfer inside tubes with bilateral alternate contractions, *Int. Chem. Engng* **5**, No. 4, 672 (1965).
- C. L. HWANG, P. J. KNIEPER and L. T. FAN, Effects of viscous dissipation on heat transfer parameters for flow between parallel plates, *Z. Angew. Math. Phys.* **16**, No. 5, 599 (1965).
- S. ISHIZAWA, The axi-symmetric laminar flow in an arbitrarily shaped narrow gap. First report: Theoretical analysis for the inlet region, *Bull. J.S.M.E.* **8**, No. 31, 353 (1965).
- T. W. JACKSON and K. R. PURDY, Resonant pulsating flow and convective heat transfer, *J. Heat Transfer* **87**, No. 4, 507 (1965).
- R. KUMAR, Heat transfer in laminar flow of a Bingham material between two parallel plates, *J. Phys. Soc. Japan* **20**, No. 7, 1255 (1965).
- P. PERROUD and J. REBIERE, Forced convection of liquid hydrogen. Part 2. Case of large temperature difference between the fluid and the wall (cylindrical channel), in French, *CEA-R-2499*, Centre d'Etudes Nucleaires, Commissariat à l'énergie Atomique, Grenoble, France (1964).
- B. S. PETUKHOV, V. V. KIRILLOV, C. TZU-HSIANG and V. N. MAIDANIK, An experimental investigation of the effect of the temperature factor on the heat exchange occurring during the turbulent flow of gas in pipes, *High Temperature* **3**, No. 1, 91 (1965).

- I. N. SADIKOV, Laminar heat exchange in the inlet section of a rectangular channel, *NASA-TT-F-9548* (1965).
- H. S. SWENSON, J. R. CARVER and C. R. KAKARALA, Heat transfer to supercritical water in smooth-bore tubes, *J. Heat Transfer* **87**, No. 4, 477 (1965).
- H. TAKAHAMA, Studies on vortex tubes: (1) Experiments on efficiency of energy separation, (2) On profiles of velocity and temperature, *Bull. J.S.M.E.* **8**, No. 31, 433 (1965).
- R. M. TURIAN, Viscous heating in the cone-and-plate viscometer. III. Non-Newtonian fluids with temperature-dependent viscosity and thermal conductivity, *Chem. Engng Sci.* **20**, No. 8, 771 (1965).
- P. M. WORSØE-SCHMIDT and G. LEPPERT, Heat transfer and friction for laminar flow of gas in a circular tube at high heating rate. Solutions for hydrodynamically developed flow by a finite difference method, *Int. J. Heat Mass Transfer* **8**, No. 10, 1281 (1965).

CONDUCTION

- K. B. BISCHOFF, Further comments on the pseudo steady-state approximation for moving boundary diffusion problems, *Chem. Engng Sci.* **20**, No. 8, 783 (1965).
- T. R. BUMP, Surface temperatures of infinite plates subjected to sudden environment temperature changes, *J. Heat Transfer* **87**, No. 4, 526 (1965).
- A. F. EMERY, Use of Biot's variational technique in heat conduction, *AIAA Jl 3*, No. 8, 1525 (1965).
- E. FRIED and H. L. ATKINS, Interface thermal conductance in a vacuum, *J. Spacecraft Rockets* **2**, No. 4, 591 (1965).
- L. M. JULI, Transient response of a transpiration-cooled cylindrical surface, *AIAA Jl 3*, No. 11, 2156 (1965).
- B. H. LEE and P. D. RICHARDSON, Effect of sound on heat transfer from a horizontal cylinder at large wavelengths, *J. Mech. Engng Sci.* **7**, No. 2, 127 (1965).
- J. L. LINSKY, A computer program to solve the heat-conduction equation in the lunar surface for temperature-dependent thermal properties, NASA CR-64833, Harvard College Observatory, Cambridge, Mass. (1965).
- M. D. MIKHAYLOV, Heating of a two-layer plate, *J. Appl. Mech. Tech. Phys.*, No. 6, 305 (1965).
- A. R. MITCHELL and G. FAIRWEATHER, Improved forms of the alternating direction methods of Douglas, Peaceman, and Rachford for solving parabolic and elliptic equations, *Num. Math.* **6**, No. 4, 285 (1965).
- I. U. OJALVO and F. D. LINZER, Improved point-matching techniques, *Q. Jl Mech. Appl. Math.* **18**, No. 1, 41 (1965).
- R. PALINSKI, Solution of nonstationary heat transfer problems for hollow cylindrical bodies with time dependent ambient temperature and surface heat supply (in German), *Nukleonik* **7**, No. 2, 93 (1965).
- B. C. RAYCHAUDHURI, Transient thermal response of enclosures integrated thermal time constant, *Int. J. Heat Mass Transfer* **8**, No. 11, 1439 (1965).
- I. M. WINER, Solution to a class of complete heat flow equations, *Q. Appl. Math.* **23**, No. 1, 82 (1965).
- M. MICHAEL YOVANOVICH, Theoretical and experimental study of thermal conductance of navy surfaces, NASA CR-64808, Massachusetts Institute of Technology, Cambridge (1965).
- N. V. ZABARITSKY, Thermal resistance of contacting metal

surfaces at helium temperatures, RSIC-406, Redstone Scientific Information Center, Army Missile Command, Huntsville, Ala. (1965).

FLOW WITH SEPARATED REGIONS

- A. A. AUSTIN, R. B. BECKMANN, R. R. ROTHFUS and R. I. KERMODE, Convective heat transfer in flow normal to banks of tubes, *I/EC Process Des. Dev.* **4**, No. 4, 379 (1965).
- J. C. DONALDSON and A. W. MYERS, Investigation of the separation and reattachment of flow downstream of a two-dimensional, rearward-facing step at Mach numbers 2.5 and 3.5, *AEDC-TR-65-223*, Von Karman Gas Dynamics Facility, Arnold Engineering Development Center, Air Force Systems Command, Arnold Air Force Station, Tenn. (1965).
- R. GARDON and J. C. AKFIRAT, The role of turbulence in determining the heat-transfer characteristics of impinging jets, *Int. J. Heat Mass Transfer* **8**, No. 10, 1261 (1965).
- J. C. Y. KOH and J. P. HARTNETT, Pressure distribution and heat transfer for flow over simulated cylindrical parachutes, *J. Heat Transfer* **87**, No. 4, 521 (1965).
- O. KRISCHER and E. MOSBERGER, Wärme- und Stoffaus tausch azischen Partikel und Luft bei Wirbelschichten und durchströmten Haufwerken, Part 1, *Chemie-Ingr.-Tech.* **37**, No. 9, 925 (1965).
- R. D. MILLS, Numerical solutions of the viscous flow equations for a class of closed flows, *Jl. R. Aeronaut. Soc.* **69**, No. 658, 714 (1965).
- M. MORDUCHOW, Review of theoretical investigations of effect of heat transfer on laminar separation, *AIAA Jl.* **3**, No. 8, 1377 (1965).
- E. NAUDASCHER, Flow in the wake of self-propelled bodies and related sources of turbulence, *J. Fluid Mech.* **22**, Part 4, 625 (1965).
- R. A. SEBAN, Heat transfer and flow in a shallow rectangular cavity, *Int. J. Heat Mass Transfer* **8**, No. 11, 1353 (1965).
- B. L. SIEGEL, W. L. MAAG, J. B. SLABY and W. F. MATTSON, Heat-transfer and pressure drop correlations for hydrogen and nitrogen flowing through tungsten wire mesh at temperatures to 5200°R, NASA TN D-2924 (1965).

HEAT AND MASS TRANSFER

- J. E. DANBERG, Characteristics of the turbulent boundary layer with heat and mass transfer at $M = 6.7$, Aerodyn. Res. Rept. 228; *NOLTR-64-99*, Naval Ordnance Lab., White Oak, Md. (1964).
- R. P. FOGAROLI, Measurements of turbulent heat transfer and skin friction reduction on a porous cone with air injection at high Mach numbers, Doc. 64SDS291, Missile and Space Div., General Electric Co., Philadelphia, Pa. (1964).
- R. B. KEEY and J. B. GLEN, Heat and mass transfer from a single sphere in an extensive flowing fluid, *Trans. Instn Chem. Engrs* **43**, No. 7, 221 (1965).
- F. L. LEVY, Contribution towards solving problems associated with vapour diffusion (in German), *Kältetechnik* **17**, No. 10, 302 (1965).
- I. MABUCHI, An experimental study on the effectiveness of

an adiabatic flat plate covered with cold air film, *Bull. J.S.M.E.* **8**, No. 31, 406 (1965).

- W. R. RANZ and P. F. DICKSON, Mass and heat transfer rates for large gradients of concentration and temperature, *I/EC Fundamentals* **4**, No. 3, 345 (1965).
- A. M. SUPONITSKIY, On calculation of thermal diffusion in laminar flow of viscous liquid at moderate values of thermal and diffusion Prandtl numbers, Air Force Systems Command, Foreign Technology Div., Wright-Patterson AFB, Ohio (1965).
- D. T. WASAN and C. R. WILKE, Analysis of gas-phase mass transfer in turbulent flows, *UCRL-11629*, Lawrence Radiation Lab., California University, Berkeley (1964).

LIQUID METALS

- S. S. FILIMONOV, M. G. KRYUKOVA and S. V. TEPOV, Investigation of heat transfer during the flow of liquid aluminum in pipes, *High Temperature* **2**, No. 6, 813 (1964).
- F. KAMINSKI, The experimental investigations of liquid sodium heat transfer and fluid flow in the laboratory convection loop (in Polish), Rept. 588/IX/R, Institute of Nuclear Research, Polish Academy of Sciences, Warsaw, Poland (1964).

LOW DENSITY

- A. DYBBS and G. S. SPRINGER, Experimental study of heat conduction through rarefied gases contained between concentric cylinders, Publ. 65-3, Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge (1965).
- G. S. SPRINGER and R. RATONYI, Heat conduction from circular cylinders in rarefied gases, *J. Heat Transfer* **87**, No. 4, 493 (1965).
- E. V. STUPOCHENKO, Temperature jump in polyatomic gases (in Russian), *Proc. Acad. Sci. USSR* **163**, No. 4, 849 (1965).
- B. J. TOWNSEND, Free molecule flow through axisymmetric tubes, *UTIAS-106*, Institute for Aerospace Studies, Toronto University, Ontario, Canada (1965).
- S. V. VALLANDER, Probabilistic description of the random process representing rarefied gas motion, *Soviet Phys. Dokl.* **10**, No. 5, 389 (1965).
- D. R. WILLIS, Heat transfer and shear between coaxial cylinders for large Knudsen numbers, *Physics Fluids* **8**, No. 10, 1908 (1965).

MAGNETOHYDRODYNAMICS

- W. J. BORNHORST, Magnetohydrodynamic effect on open-channel flow, *AIAA Jl.* **3**, No. 6, 1180 (1965).
- R. J. GRIBBEN, Magnetohydrodynamic stagnation-point flow, *Q. Jl. Mech. Appl. Math.* **18**, Part 3, 357 (1965).
- R. M. GUNDERSEN, Quasi-one-dimensional magnetohydrodynamic flow with heat addition, III, *Z. Angew. Math. Phys.* **16**, No. 3, 413 (1965).
- W. H. HEISER and J. A. SHERCLIFF, A simple demonstration of the Hartmann layer, *J. Fluid Mech.* **22**, Part 4, 701 (1965).
- J. B. HEYWOOD, An MHD channel flow with temperature

- dependent electrical conductivity, *AIAA Jl 3*, No. 9, 1752 (1965).
- J. B. HEYWOOD and W. C. MOFFATT, Validity of integral methods in MHD boundary-layer analyses, *AIAA Jl 3*, No. 8, 1565 (1965).
- O. R. KONENKO, Diffusion flow of helium plasma in the presence of an electron temperature gradient, *High Temperature 3*, No. 1, 145 (1965).
- K. H. LILLICH, The treatment of magnetofluidodynamical flow processes in thermodynamical state diagrams (in German), *Z. Ver. Dt. Ing. 107*, No. 18, 803 (1965).
- E. PFENDER and E. R. G. ECKERT, Behavior of an electric arc with superimposed axial flow, *Proceedings of the 1965 Heat Transfer and Fluid Mechanics Institute*. Stanford University Press, Stanford, Calif. (1965).
- D. C. SMITH and A. B. CAMBEL, Laminar and turbulent magnetohydrodynamic free jet, *ARL 65-172*, Office of Aerospace Research, U.S. Air Force, Wright-Patterson AFB, Ohio (1965).
- J. SRINIVASAN, Combined natural and forced convection hydromagnetic flow between electrically conducting walls, *Appl. Scient. Res. B11*, No. 5, 361 (1964/65).
- L. P. YARIN, Aerodynamic calculation of a gas flame in MHD, *ATD-T-65-58*, Aerospace Technology Div., Library of Congress, Washington, D.C. (1965).

MEASUREMENT TECHNIQUES

- J. A. ACKERMAN and G. A. BRILL JR., Final report on research on the adaptability of lasers to Schlieren systems, *ARL 65-139*, Office of Aerospace Research, U.S. Air Force, Wright-Patterson AFB, Ohio (1965).
- W. H. BELL, Small displacement, self-balancing differential manometer, *WAPD-5-1708*, Bettis Atomic Power Lab., Pittsburgh, Pa. (1964).
- H. BERGH and H. TIJDEMAN, Theoretical and experimental results for the dynamic response of pressure measuring systems, Rept. No. *NLR-TR F.238*, National Aero- and Astronautical Research Institute, Amsterdam (1965).
- G. BETTERMAN, Contribution to the determination of measuring errors in the temperature measurement with thermocouples in flowing, hot gases, with particular reference to gas emissions (in German), *Z. Ver. Dt. Ing. 107*, No. 27, 1320 (1965).
- J. I. CONNOLLY, W. R. ROACH and R. I. SARWINSKY, Transfer of heat below 0.2°K—a comparison of bonding agents, *Rev. Scient. Instrum. 36*, No. 9, 1370 (1965).
- S. CUNSOLO, M. SANTINI and M. VINCENTINI-MISONI, Interpolation and extrapolation of a carbon resistance thermometer calibration data in the liquid helium II region, *Cryogenics 5*, No. 3, 168 (1965).
- E. DONTI, The determination of the heat conductivity according to a stationary method, *FTD-TT-65-372/1 + 2 + 4*, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- V. E. FINKEL SHTEIN, Effect of surface cooling on the accuracy of measuring the blackness coefficient in radiation cooling of samples, *High Temperature 3*, No. 1, 120 (1965).
- YU. YA. FOMIN and B. K. GUNDORIN, Measurement of rapidly-changing temperatures of fuel at high pressures, *Measmt Tech., Pittsb.*, No. 2, 152 (1965).
- D. F. FRAZINE, Design of a total radiation thermopile detector, *J. Spacecraft Rockets 2*, No. 4, 636 (1965).
- R. J. GOLDSTEIN, Interferometer for aerodynamic and heat transfer measurements, *Rev. Scient. Instrum. 36*, No. 10, 1408 (1965).
- G. HAACKE and D. P. SPITZER, Method for thermal conductivity measurements on solids, *J. Scient. Instrum. 42*, No. 9, 702 (1965).
- A. S. HOFFMAN, J. G. DOIDGE and D. G. MOONEY, Inverted reference-beam hologram, *J. Opt. Soc. Am. 55*, No. 11, 1559 (1965).
- D. JAFFE, An apparatus for the measurement of the thermal conductivity of irradiated solids in the range 100–200°C, *WAPD-T-1742* Bettis Atomic Power Lab., Pittsburgh, Pa. (1964).
- A. B. KAMENETSKII and N. V. GULKO, Interaction between the thermo-electrodes of tungsten-rhenium thermocouples and insulation made of pure oxides (in Russian), *Izmerit. Tekh.*, No. 6, 19 (1965).
- YU. A. KOMAROV, G. F. MUCHNIK and E. V. SMIRNOV, Method of determining the integrated degree of blackness at temperatures of 100–1000, *High Temperature 2*, No. 6, 825 (1964).
- A. L. KING, Simple viscosimetric experiment, *Am. J. Phys. 33*, No. 10, 848 (1965).
- M. R. LAUVER, J. L. HALL and F. E. BELLES, Shock-tube gas temperature measurements by infrared monochromatic radiation pyrometry, *NASA TN D-2955* (1965).
- R. LETAN and E. KEHAT, The measurement of temperature and concentration of organic drops flowing in a continuous aqueous medium, *Chem. Engng Sci. 20*, No. 9, 856 (1965).
- H. L. MATTHEWS, Thermocouple calibration in a subsonic air flow, M.S. Thesis, Wyoming University, Laramie (1965).
- W. F. MERZKIRCH, A simple Schlieren interferometer system, *AIAA Jl 3*, No. 10, 1974 (1965).
- M. D. MIKHAILOV, On measuring the temperature of streams of pulsating velocity (in Russian), *Izmerit. Tekh.*, No. 5, 24 (1965).
- V. V. MIRKOVICH, Comparative method and choice of standards for thermal conductivity determinations, *J. Am. Ceram. Soc. 48*, No. 8, 387 (1965).
- D. NAHSHOI, Measuring viscosity by Stoke's law, *Am. J. Phys. 33*, No. 8, 657 (1965).
- V. C. PATEL, Calibration of the Preston tube and limitations on its use in pressure gradients, *J. Fluid Mech. 23*, Part 1, 185 (1965).
- A. D. PINCHEVSKII, Analysis of the transient response of a thermal detector, *High Temperature 3*, No. 1, 132 (1965).
- I. C. ROMER JR. and P. E. KOENTOP, Tube method for measuring the velocity of sound in gases, *Am. J. Phys. 33*, No. 10, 803 (1965).
- YU. L. ROZENSHMOK, Dispersion and accidental error of measurement of temperature of locally isotropic turbulent flow, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- D. M. SHCHERBINA, A method of measuring emissivity, *High Temperature 3*, No. 1, 143 (1965).
- A. N. SEREZINOV, Method of decreasing the noise level at the input of an instrument for measuring temperature using

- thermocouples (in Russian), *Izmerit. Tekh.*, No. 6, 17 (1965).
- A. SIGALIA, Calibration of Preston tubes in supersonic flow, *AIAA Jl 3*, No. 8, 1531 (1965).
- A. N. SOLOV'EV and A. B. KAPLAN, The vibration method of measuring the viscosity of liquids, *High Temperature* 3, No. 1, 124 (1965).
- G. E. TANGER, G. H. NIX, S. C. CHENG and G. W. LOWERY, Thermal diffusivity. Measurement techniques and data analysis, Report XI, Auburn Research Foundation, Inc., Alabama (1965).
- P. S. TSCHANG, Temperature determination in moderately dense, high-temperature gases by transient thermocouple probes, *ARL-65-95*, Plasma Engineering Lab., Columbia University, New York (1965).
- O. B. TSVETKOV, Setup for determining thermal conductivity, Joint Publications Research Service, Washington, D.C. (1965).
- S. R. WEBB, H. KASPAR and J. M. ZIMMERMAN, Statistical analysis for thermometric sensors test program, NASA CR-65139, Rocketdyne, Canoga Park, Calif. (1965).
- A. WHILLIER and D. TOUT, Integrating instrument for measuring daily values of total solar radiation, *Sol. Energy* 9, No. 4, 208 (1965).
- N. A. YARYSHEV, Equations for the heat exchange of thermometers with heat removal and radiation taken into account (in Russian), *Izmerit. Tekh.*, No. 5, 20 (1965).
- A. A. ZENIN, On heat exchange of microthermocouples under conditions of combustion of condensed substances, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).

NATURAL CONVECTION

- T. D. BANSAL, Steady state free convection phenomenon, *J. Scient. Ind. Res.* 24, No. 6, 271 (1965).
- R. F. BARRON and L. S. HAN, Heat and mass transfer to a cryosurface in free convection, *J. Heat Transfer* 87, No. 4, 499 (1965).
- J. C. BERG and A. ACRIVOS, The effect of surface active agents on convection cells induced by surface tension, *Chem. Engng Sci.* 20, No. 8, 737 (1965).
- H. BÖRNER, On the heat and mass exchange on circumcirculated individual bodies by superposition of free and forced flow (in German), *Z. Ver. Dt. Ing.* 107, No. 18, 805 (1965).
- IU. K. BRATUKHIN and M. I. SHLIOMIS, On an exact solution of nonstationary convection equations, *J. Appl. Math. Mech.* 28, No. 5, 1160 (1964).
- P. M. BRDLIK and V. A. MOCHALOV, Porous blowing and suction during free convection at a vertical surface (laminar layer), *Int. Chem. Engng* 5, No. 4, 603 (1965).
- S. H. DAVIS and L. A. SEGEL, The effects of surface curvature and property variation on cellular convection, Memo. RM-4709-PR, The RAND Corp., Santa Monica, Calif. (1965).
- J. W. ELDER, Laminar free convection in a vertical slot, *J. Fluid Mech.* 23, Part 1, 77 (1965).
- J. W. ELDER, Turbulent free convection in a vertical slot, *J. Fluid Mech.* 23, Part 1, 99 (1965).
- G. B. FIELD, Thermal stability, *Astrophys. J.* 142, No. 2, 531 (1965).

T. D. FOSTER, Onset of convection in a layer of fluid cooled from above, *Physics Fluids* 8, No. 10, 1770 (1965).

W. W. FOWLIS and R. HIDE, Thermal convection in a rotating annulus of liquid: effect of viscosity on the transition between axisymmetric and non-axisymmetric flow regimes, *J. Atmos. Sci.* 22, No. 5, 541 (1965).

J. E. FROMM, Numerical solutions of the nonlinear equations for a heated fluid layer, *Physics Fluids* 8, No. 10, 1757 (1965).

G. H. GELB and D. DROPPIN, Measurements in the thermal field, *Int. J. Heat Mass Transfer* 8, No. 11, 1341 (1965).

D. R. GRANT, Convective motions in a free atmosphere, *Met. Mag., Lond.* 94, No. 1117, 254 (1965).

R. G. HERING, Laminar free convection from a non-isothermal cone at low Prandtl numbers, *Int. J. Heat Mass Transfer* 8, No. 10, 1333 (1965).

D. LORTZ, A stability criterion for steady finite amplitude convection with an external magnetic field, *J. Fluid Mech.* 23, Part 1, 113 (1965).

D. D. LUNDBERG and J. A. MILLER, Laminar convective heat transfer in the entrance region between parallel flat plates, *TR-54*, Naval Postgraduate School, Monterey, Calif. (1965).

E. C. NICKERSON, A numerical experiment in buoyant convection involving the use of heat source, *J. Atmos. Sci.* 22, No. 4, 412 (1965).

P. H. OOSTHUIZEN, The effect of heat transfer on chimney draught, *S. Afr. Mech. Engr* 14, No. 6, 124 (1965).

I. G. REILLY, C. TIEN and M. ADELMAN, Experimental study of natural convective heat transfer from a vertical plate in a non-Newtonian fluid, *Can. J. Chem. Engng* 43, No. 4, 157 (1965).

M. G. SCHERBERG, Natural convection at a thermal leading edge on a vertical wall, *Int. J. Heat Mass Transfer* 8, No. 10, 1319 (1965).

A. SCHLUTER, D. LORTZ and F. BUSSE, On the stability of steady finite amplitude convection, *J. Fluid Mech.* 23, Part 1, 129 (1965).

K. SCHWIER, Heat transfer in horizontal pipe at laminar flow and its dependence on free convection and on temperature dependent properties (in German), *Z. Ver. Dt. Ing.* 107, No. 18, 805 (1965).

M. I. SHLIOMIS, On oscillatory convective instability of a conducting fluid in a magnetic field, *J. Appl. Math. Mech.* 28, No. 4, 833 (1964).

J. R. WELLING and C. B. WOOLDRIDGE, Free convection heat transfer coefficients from rectangular vertical fins, *J. Heat Transfer* 87, No. 4, 439 (1965).

PACKED AND FLUIDIZED BEDS

G. N. BHAT and E. WEINGAERTER, Studies on the gaseous fluidization of solids. Part V: Wall-to-bed heat transfer characteristics, *Br. Chem. Engng* 10, No. 9, 615 (1965).

M. N. MARKOVA and I. G. MARTYUSHIN, An investigation of mass transfer during the vaporization of water from the surface of objects immersed in a fluidized bed of finely divided material, *Int. Chem. Engng* 5, No. 4, 587 (1965).

V. S. Nosov and N. I. SYROMIATNIKOV, Fundamental heat transfer relations of fine dispersion flows (in Russian), *Dokl. Akad. Nauk SSSR* 163, No. 3, 624 (1965).

- B. WASMUND and J. W. SMITH, The mechanism of wall to fluid heat transfer in particularly fluidized beds, *Can. J. Chem. Engng* **43**, No. 5, 246 (1965).

RADIATION

- R. A. ALLEN, Air radiation graphs: Spectrally integrated fluxes including line contributions and self absorption, Research Report 230, AVCO-Everett Research Lab., Everett, Mass. (1965).
- R. C. BIRKEBAK, J. P. DAWSON, B. A. MCCULLOUGH and B. E. WOOD, Hemispherical reflectance of metal surfaces as a function of wavelength and surface roughness, *AEDC-TR-65-170*, Aerospace Environmental Facility, Arnold Engineering Development Center, Air Force Systems Command, Arnold Air Force Station, Tenn. (1965). •
- J. R. BRANSTETTER, Formulas for radiant heat transfer between nongray parallel plates of polished refractory metals, *NASA TN D-2902* (1965).
- E. A. BRUN, Élévation de la température d'un gaz à la sortie d'un échangeur par addition de poussières, *Astronautica Acta* **11**, No. 1, 43 (1965).
- O. GERMAN and Z. GABOSH, On the thermal radiation of substances, *Optics Spectrosc.*, N.Y. **18**, No. 5, 512 (1965).
- L. D. GRAY, Spectral emissivity calculations for the parallel bands of carbon dioxide at 4.3 microns, Tech. Rept. No. 32-754, Jet Propulsion Lab., California Institute of Technology, Pasadena (1965).
- R. G. HERING, A. F. HOUCHEWS and T. SMITH, Theoretical study of radiant heat exchange for non-gray, non-diffuse surfaces in a space environment, *NASA CR-64669*, Illinois University, Urbana (1965).
- B. M. HERMAN and S. R. BROWNING, A numerical solution to the equation of radiative transfer, *J. Atmos. Sci.* **22**, No. 5, 559 (1965).
- H. HEYWOOD, The computation of solar radiation intensities, *Sol. Energy* **9**, No. 4, 223 (1965).
- R. R. HIBBARD, Method for estimating ratio of absorptance to emittance, *NASA TN D-2751* (1965).
- B. J. HISDAL, Reflectance of nonperfect surfaces in the integrating sphere, *J. Opt. Soc. Am.* **55**, No. 10, 1255 (1965).
- H. HOSHIZAKI and K. H. WILSON, Viscous, radiating shock layer about a blunt body, *AIAA Jl 3*, No. 9, 1614 (1965).
- H. H. KAGIWADA, R. E. KALABA and R. E. BELLMAN, Numerical estimation of derivatives with an application to radiative transfer in spherical shells, *NASA CR-64643*, RAND Corp., Santa Monica, Calif. (1965).
- J. L. KULANDER, Non-equilibrium radiation, *R64SD41*, Missile and Space Div., General Electric Co., Philadelphia, Pa. (1965).
- N. C. LATTURE, Thermal space simulation testing, comparison of results obtained from solar and heat flux irradiated surfaces, *AEDC-TR065-107*, ARO Inc., Arnold Air Force Station, Tenn. (1965).
- J. A. MCALISTER, E. Y. H. KENG and C. ORR JR., Heat transfer to a gas containing a cloud of particles, *NASA CR-54441*, Engineering Experiment Station, Georgia Institute of Technology, Atlanta (1965).
- B. A. MCCULLOUGH, B. E. WOOD and J. P. DAWSON, Thermal radiative properties of carbon cryodeposits from 0.5 to 1.1 microns, *AEDC-TR-94*, ARO Inc., Arnold Air Force Station, Tenn. (1965).
- T. W. MULLIKEN, A nonlinear integrodifferential equation in radiative transfer, *J. Soc. Ind. Appl. Math.* **13**, No. 2, 388 (1965).
- R. M. NEREM and G. H. STICKFORD, Shock-tube studies of equilibrium air radiation, *AIAA Jl 3*, No. 6, 1011 (1965).
- A. S. NEVSKII and L. A. CHUKANOVA, The physical meaning of the different methods of calculating the radiation from a selectively radiating medium at a variable temperature, *High Temperature* **3**, No. 1, 110 (1965).
- S. OLLENDORFF, Analytical determination of the effective emittance of an insulated louver system, *NASA TM-X-54804*, Goddard Space Flight Center, NASA, Greenbelt, Md. (1965).
- T. J. QUINN, The effect of thermal etching on the emissivity of tungsten, *Br. J. Appl. Phys.* **16**, No. 7, 973 (1965).
- J. RICHTER and H. E. SCHMIDT, Evaluation of calculations on the problem of heat transfer by radiation in solids (in German), *EUR-2409.3*, European Atomic Energy Community, Brussels, Belgium (1965).
- I. C. ROBERTS and D. A. GOODWIN, Analysis of ASTR radiation heating in aero-space structural materials, *FZK-202; WL-TR-64-152*, Nuclear Aerospace Facility, General Dynamics, Fort Worth, Texas (1965).
- V. V. SALOMATOV and G. P. BOIKOV, Radiant heat fluxes in heating bodies from variable temperature sources, *Int. Chem. Engng* **5**, No. 4, 662 (1965).
- M. SIBULKIN, Absorption and emission characteristics of an ideal radiating gas, *NONR(562)35/7*, Division of Engineering, Brown University, Providence, R.I. (1965).
- E. M. SPARROW and S. H. LIN, Boundary layers with prescribed heat flux—application to simultaneous convection and radiation, *Int. J. Heat Mass Transfer* **8**, No. 3, 437 (1965).
- K. C. WANG, Radiating shock layers, *RR-67*, Martin Co., Baltimore, Md. (1965).
- B. E. WOOD, B. A. MCCULLOUGH, J. P. DAWSON and R. C. BIRKEBAK, Vacuum integrating spheres for measuring cryodeposit reflectances from 0.35 to 15 microns, *AEDC-TR-65-178*, ARO Inc., Arnold Air Force Station, Tenn. (1965).
- V. S. ZARUBIN, Temperature state of a thick spherical shell, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- R. ZIRKIND, Emission of optical radiation from high pressure gases, *PIBAL-814*, Dept of Aerospace Engineering and Applied Mechanics, Polytechnic Institute of Brooklyn, N.Y. (1964).

ROTATING SURFACES

- D. J. BENNEY, The flow induced by a disk oscillating about a state of steady rotation, *Q. Jl Mech. Appl. Math.* **18**, Part 3, 333 (1965).
- A. A. HAYDAY, On heat transfer from isothermal and non-isothermal spinning bodies of revolution, *J. Heat Transfer* **87**, No. 4, 445 (1965).
- D. D. JOSEPH, Note on steady flow induced by rotation of a naturally permeable disk, *Q. Jl Mech. Appl. Math.* **18**, Part 3, 325 (1965).

- J. W. MITCHELL and D. E. METZGER, Heat transfer from a shrouded rotating disk to a single fluid stream, *J. Heat Transfer* **87**, No. 4, 485 (1965).
- F. SALZBERG and S. P. KEZIOS, Mass transfer from a rotating cone in axisymmetric flow, *J. Heat Transfer* **87**, No. 4, 469 (1965).

THERMODYNAMIC AND TRANSPORT PROPERTIES

- W. F. AHYTE, Total thermal conductivity of partially and fully ionized gases, *Physics Fluids* **8**, No. 10, 1918 (1965).
- A. AKSARAILIA and O. CERCEAU, Theoretical calculations of the viscosity of methane and methyl chloride (in Spanish), *Acta Cient. Venez.* **16**, No. 2, 54 (1965).
- KH. I. AMIRKHANOV, G. V. STEPANOV and B. A. MURSAKOV, Specific heat in heavy water near the critical point (in Russian), *Dokl. Akad. Nauk SSSR* **163**, No. 5, 1189 (1965).
- A. M. BANAEV and V. YA. CHEKHOVSKOI, Experimental determination of the coefficient of thermal conductivity of solid materials in the temperature range 200–1000°C, *High Temperature* **3**, No. 1, 47 (1965).
- N. B. BARGAFTIK and N. KH. ZIMINA, Thermal conductivity of nitrogen at high temperatures, *High Temperature* **2**, No. 6, 782 (1964).
- W. BARHO, The molar specific heats of fluorine-chlorine-derivatives of methane in the ideal gas state (in German), *Kältetechnik* **17**, No. 7, 219 (1965).
- L. S. BARK, P. P. GANSON and N. A. MEISTER, Tables of the velocity of sound in sea water, *Am. J. Phys.* **33**, No. 8, 662 (1965).
- K. E. BETT and J. B. CAPPI, Effect of pressure on the viscosity of water, *Nature, Lond.* **207**, No. 4997, 620 (1965).
- P. E. BLACKBURN, Thermodynamics of condensed and vapor phases in the binary and ternary systems of Be–B–O, Al–B–O, Si–O, AlOBe–O and Al–B–F, ARPA Order 315-62, Arthur D. Little, Cambridge, Mass. (1965).
- D. BREZING, Transport properties of hydrogen, *AIAA Jl* **3**, No. 8, 1422 (1965).
- A. CEZAIRLIYAN and Y. S. TOULOUKIAN, Generalization and calculation of the thermal conductivity of metals by means of the law of corresponding states, *High Temperature* **3**, No. 1, 63 (1965).
- J. P. COUGHLIN, Needs for the thermodynamic data on heavy elements and compounds, Solid Propellant Research Div., Aerojet-General Corp., Sacramento, Calif. (1965).
- D. J. CRONIN, Temperature and pressure dependence of the viscosity of gases, *Am. J. Phys.* **33**, No. 10, 835 (1965).
- A. E. DEVRIES and A. HARING, Thermal diffusion and transfer of rotational energy, *Z. Naturf.* **A20**, No. 3, 433 (1965).
- F. DIN and I. BURN, Departures from Dalton's and Amagat's laws: Mixtures of oxygen with carbon dioxide or nitrous oxide, *Trans. Faraday Soc.* **61**, Part 7, 1351 (1965).
- F. J. DUCHATENIER, B. M. BOERSTOEL and J. DE NOBEL, Specific heat capacity of a stainless steel, *Physica, 's Grav.* **31**, No. 7, 1061 (1965).
- P. A. EGELSTAFF, The thermal motion of simple liquids, *Br. J. Appl. Phys.* **16**, No. 9, 1219 (1965).
- K. EIERMANN, The determination and meaning in terms of models in the heat conductivity of high-polymers (in German), *Z. Ver. Dt. Ing.* **107**, No. 30, 1452 (1965).
- O. EKINER and G. THODOS, Critical temperatures and pressures of the ethane–n-heptane system, *Can. J. Chem. Engng* **43**, No. 4, 205 (1965).
- R. EVANGELISTI and F. ISACCHINI, The thermal conductivity of sodium in the temperature range 90–850°C, *Int. J. Heat Mass Transfer* **8**, No. 10, 1303 (1965).
- J. M. GANDHI and S. C. SAXENA, Calculation of translational thermal conductivity of gas mixtures at high temperatures, *Indian J. Pure Appl. Phys.* **3**, No. 8, 312 (1965).
- P. E. GLASER, I. A. BLACK and P. R. DOHERTY, Multilayer insulation, *Mech. Engng* **87**, No. 8, 23 (1965).
- A. A. GLINSKII, An acoustical effect in liquid-vapor systems near the critical point, *Soviet Phys. Acoust.* **11**, No. 1, 87 (1965).
- F. A. GUEVARA and W. E. WAGEMAN, Measurement of helium and hydrogen viscosities to 2340°K, LA-3319, Los Alamos Scientific Lab., New Mexico (1965).
- E. A. GUGGENHEIM, Variations on van der Walls' equation of state for high densities, *Molec. Phys.* **9**, No. 2, 199 (1965).
- W. G. HOOVER and F. H. REE, Calculation of virial coefficients. Squares and cubes with attractive forces, *J. Chem. Phys.* **43**, No. 2, 375 (1965).
- R. HULTGREN, Availability of thermodynamic data at high temperatures for metals and alloys, Lawrence Radiation Lab., California University, Berkeley (1965).
- J. JASPER, The thermodynamic properties of liquid surfaces and interfacial monolayers, *Rec. Chem. Prog.* **26**, No. 3, 169 (1965).
- R. A. JONES and J. L. HUNT, An improved technique for obtaining quantitative aerodynamic heat-transfer data with surface coating materials, *J. Spacecraft Rockets* **2**, No. 4, 632 (1965).
- P. M. KESSEL'MAN, Calculation of the thermal properties of real gases at high temperature, *High Temperature* **2**, No. 6, 791 (1964).
- A. J. LEADBETTER, The thermodynamic and vibrational properties of H_2O ice and D_2O ice, *Proc. R. Soc. A287*, No. 1410, 403 (1965).
- B. LENEINDRE, P. JOHANNIN and B. VODAR, Determination du coefficient de conductibilité thermique de l'eau lourde en phase liquide, jusqu'à la température critique, *C.R. Acad. Sci., Paris* **261**, No. 1, 63 (1965).
- I. LICES, On the electric thermal conductivity of solids, *Physica Status Solidi* **10**, No. 2, K115 (1965).
- S. MALLIKARJUN and N. E. HILL, Temperature dependence of viscosity and dielectric relaxation time in simple polar liquids, *Trans. Faraday Soc.* **61**, Part 7, 1389 (1965).
- V. A. MALYSHEV, Law of corresponding states for the dependence of the pressure of a vapor saturating a liquid on temperature (in Russian), *Bull. Inst. Higher Education—Physics*, No. 4, 144 (1965).
- R. MARCHAL, R. DELMAS and A. WOHLGROTH, Sur l'énergie utilisable de diffusion des gaz parfaits, *C.R. Acad. Sci., Paris* **261**, No. 10, 2067 (1965).
- F. R. MCCOURT and R. F. SNIDER, Transport properties of gases with rotational states, II, *J. Chem. Phys.* **43**, No. 7, 2276 (1965).
- G. MENON, The interaction virial coefficient of binary gas mixtures, *Indian J. Pure Appl. Phys.* **3**, No. 9, 334 (1965).

- L. MONCHICK, E. A. MASON, R. J. MUNN and F. J. SMITH, Transport properties of gaseous He³ and He⁴, *Phys. Rev.* **139**, No. 4A, 1076 (1965).
- T. E. MORSY, A new vapor chart for the refrigerant R 114 (in German), *Kältetechnik* **17**, No. 3, 86 (1965).
- G. NARSIMHAN, A generalized chart for saturated liquid densities, *Indian J. Technol.* **3**, No. 7, 230 (1965).
- G. NARSIMHAN, On a reference state for a reduced correlation of latent heat of vaporization, *Indian J. Technol.* **3**, No. 9, 294 (1965).
- D. P. NEEDHAM and H. ZIEBLAND, The thermal conductivity of liquid and gaseous ammonia, and its anomalous behaviour in the vicinity of the critical point, *Int. J. Heat Mass Transfer* **8**, No. 11, 1387 (1965).
- D. F. OTHMER and H. N. HUANG, Correlating vapor pressure and latent heat data, *Ind. Engng Chem.* **57**, No. 10, 42 (1965).
- R. PAUL, A. J. HOWARD and W. W. WATSON, Isotropic thermal-diffusion factor for Xenon, *J. Chem. Phys.* **43**, No. 6, 1890 (1965).
- G. ACHUTA RAMAYYA and N. R. KULOOR, Principle of corresponding states and its extension to thermodynamic properties of gases, *Indian J. Chem.* **3**, No. 7, 293 (1965).
- R. V. GOPALA RAO, Phenomenological theory of surface tension and compressibility: Evaluation of the parameter τ , *Indian J. Pure Appl. Phys.* **3**, No. 7, 233 (1965).
- TERESA S. REE, T. REE, H. EYRING and R. PERKINS, The reduced thermodynamic functions for the significant structure theory of simple liquids, *J. Phys. Chem.* **69**, No. 10, 3222 (1965).
- H. M. RODER, L. A. WEBER and R. D. GOODWIN, Thermodynamic and related properties of para-hydrogen from the triple point to 100°K at pressures to 340 atmospheres, NASA CR-64444 NBS-Monograph-94, National Bureau of Standards, Washington, D.C. (1965).
- J. C. ROSSI and F. DANON, Intermolecular forces of the heavy rare gases, *J. Chem. Phys.* **43**, No. 2, 762 (1965).
- J. S. ROWLINSON, A test of Kihara's intermolecular potential, *Molec. Phys.* **9**, No. 2, 197 (1965).
- M. P. SAKSENA and S. C. SAXENA, Second virial coefficient of non-polar non-spherical molecules, *Phys. Letters* **18**, No. 2, 120 (1965).
- J. V. SENGERS, Density expansion of the viscosity of a moderately dense gas, *Phys. Rev. Lett.* **15**, No. 12, 515 (1965).
- YU. N. SIMONOVA and L. P. FILIPPOV, Heat conductivity of tungsten at high temperatures, NASA-TT-F-9553, National Aeronautics and Space Administration, Washington, D.C. (1965).
- D. STRAUB, A. SCHABER and T. E. MORSY, The Joule-Thomson curve of some substances (in German), *Kältetechnik* **17**, No. 7, 212 (1965).
- A. R. TAYLOR JR. and T. ESTELLE GARDNER, Some thermal properties of beryllium fluoride from 8° to 1,200°K, *BM-RI-6664*, Bureau of Mines, Tuscaloosa, Ala. (1965).
- A. A. VASSERMAN, Thermodynamic properties of air to 1000°C and 1000 bar, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio in its *Heat Power Engng*, p. 28, June (1965).
- J. E. S. VENART, Liquid thermal conductivity measurements, *J. Chem. Engng Data* **10**, No. 3, 239 (1965).
- D. S. VISWANATH, Gas diffusion coefficients and ideal critical volume, *Indian J. Technol.* **3**, No. 9, 295 (1965).
- D. S. VISWANATH and N. R. KULOOR, Theorem of corresponding states, *J. Scient. Ind. Res.* **24**, No. 7, 374 (1965).
- A. V. VORONEL', V. G. SNIGIREV and YU. R. CHASHKIN, Behavior of the specific heat C_v of pure substances near the critical point, *Soviet Phys. JETP* **21**, No. 3, 653 (1965).
- W. W. WELLER, Low-temperature heat capacities and entropies at 298-15°K of anhydrous sulfates of cobalt, copper, nickel and zinc, *BM-RI-6669*, Berkeley Thermodynamics Lab., Bureau of Mines, Berkeley, Calif. (1965).
- A. WILLIAMS, Effect of cold work on the thermal conductivity of copper, *J. Mech. Engng Sci.* **7**, No. 335 (1965).
- J. N. WILSON, On the London potential between pairs of rare gas atoms, *J. Chem. Phys.* **43**, No. 7, 2564 (1965).
- R. ZWANZIG, Time-correlation functions and transport coefficients in statistical mechanics, *A. Rev. Phys. Chem.* **16**, 67 (1965).

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- W. G. CLAY, J. HERRMANN and R. E. SLATTERY, Statistical properties of the turbulent wake behind hypervelocity spheres, *Physics Fluids* **8**, No. 10, 1792 (1965).
- L. I. DEVERALL and R. S. CHANNAPRAGADA, Invariancy of total shear stress for compressible turbulent flows, *AIAA Jl* **3**, No. 8, 1513 (1965).
- D. A. LEE, Spectrum of homogeneous turbulence in the final stage of decay, *Physics Fluids* **8**, No. 10, 1911 (1965).
- H. LIEN, A single formula for the velocity distribution in the turbulent inner and outer boundary layers, *AIAA Jl* **3**, No. 9, 1766 (1965).
- C. E. PETERS, A model for the free turbulent eddy viscosity, *AEDC-TR-65-209*, Rocket Test Facility, Arnold Engineering Development Center, Air Force Systems Command, Arnold Air Force Station, Tenn. (1965).
- H. TENNEKES, Velocity-defect laws for transpired turbulent boundary layers, *AIAA Jl* **3**, No. 10, 1950 (1965).