
REFERENCES

- Agrawal, S.K. and Lin, S.P., 1975, Nonlinear spatial instability of a film coating on a plate, *Trans. of the ASME J. Applied Mech.*, Sept., pp. 580-583.
- Alekseenko, S.V., Nakoryakov, V.E., Pokusaev, B.G., 1979a, Wave formation at liquid film flow on a vertical wall (in Russian), *Zhurn. Prikl. Mekh. Tekhn. Fiz.*, 6, pp. 77-87.
- Alekseenko, S.V., Nakoryakov, V.E., Pokusaev, B.G., 1979b, *Waves on the Surface of Vertically Falling Liquid Film* (in Russian), Preprint No 36-79, IT SO AN SSSR, Novosibirsk.
- Alekseenko, S.V., Nakoryakov, V.E., Pokusaev, B.G., 1985a, Wave formation on a vertically falling liquid film, *AIChE J.*, **32**, pp. 1446-1460.
- Alekseenko, S.V., Nakoryakov, V.E., Pokusaev, B.G., 1985b, Wave formation on vertical falling liquid films, *Int. J. Multiphase Flow*, **11**, 5, pp. 607-627.
- Alekseenko, S.V., Nakoryakov, V.E., Pokusaev, B.G., Khristoforov, V.V., 1973, Shear stress at film falling down a vertical wall (in Russian), *Inzh.-Fiz. Zhurn.*, **24**, 5, pp. 824-830.
- Alekseenko, S.V., Shtork, S.I., 1987, Three-dimensional standing waves on liquid film falling down an inclined plate (in Russian), *Zhurn. Prikl. Mekh. Tekhn. Fiz.*, 4, pp. 157-164.
- Amenitsky, A.N., Rinkevichus, B.S., Fabrikant, V.A., 1969, Measurement of velocity distribution in liquid films using an optical quantum generator (in Russian), *Teplofizika Vysokikh Temperatur*, **7**, 5, pp. 1039-1041.
- Andersson, H., 1987, Diffusion from a vertical wall into an accelerating falling liquid film, *Int. J. Heat Mass Transfer*, **30**, 4, pp. 683-689.
- Atkinson, B., Caruthers, P.A., 1965, Velocity profile measurements in liquid films, *Trans. Inst. Chem. Engrs.*, **43**, 2, pp. 23-29.

- Azuma, T., Hoshino, T., 1984, The radial flow of a thin liquid film, *Bull. JSME.*, **27**, 234, pp. 2739-2770.
- Bach, R., Villadsen, J., 1984, Simulation of the vertical flow of a thin, wavy film using a finite-element method, *Int. J. Heat Mass Transfer*, **27**, 6, pp. 815-827.
- Bagaeva, S.D., Semenov, P.A., Galiullin, M.F., 1973, Diffusion at wave motion of a thin liquid layer (in Russian), *Teor. Osnovy Khim. Tekhn.*, **7**, 4, pp. 504-511.
- Baikov, V.I., Listrov, A.T., Shabunina, Z.A., 1982, Stability of a film falling down an oscillating surface (in Russian), *Inzh.-Fiz. Zhurn.*, **43**, 6, pp. 1006-1012.
- Banerjee, S., Rhodes, E., Scott, D.S., 1967, Mass transfer to falling wavy liquid films at low Reynolds numbers, *Chem. Eng. Sci.*, **22**, p. 43.
- Bankoff, G.S., 1971, Stability of liquid flow down a heated inclined plane, *Int. J. Heat Mass Transfer*, **14**, 3, pp. 377-385.
- Barndahl, R., 1986, On the stability of falling films - periodic, finite-amplitude waves, *AICHE J.*, **32**, 5, pp. 789-797.
- Barndahl, R.A.G., 1988, Mass transfer in falling films: Influence of finite-amplitude waves, *AICHE J.*, **34**, 3, pp. 493-498.
- Bays, G.S., McAdams, W.H., 1937, Heat transfer coefficients in falling film heaters, streamline flow, *Industr. Engin. Chem.*, **29**, 11, pp. 1240-1246.
- Benjamin, T.B., 1957, Wave formation in laminar flow down an inclined plane, *J. Fluid Mech.*, **2**, pp. 554-574.
- Benjamin, T.B., 1961, The development of three-dimensional disturbances in an unstable film liquid flowing down an inclined plane, *J. Fluid Mech.*, **10**, 3, pp. 401-419.
- Benney, D.J., 1966, Long waves on liquid films, *J. Math. and Phys.*, **45**, pp. 150-155.
- Berbente, C.P., Ruckenstein, E., 1968, Hydrodynamics of wave flow, *AICHE J.*, **14**, 5, pp. 772-782.
- Bernshtam, V.A., Manzon, I.M., 1989, Resonance film magnetic hydrodynamic flow along the corrugated surface at large Gartman numbers (in Russian), *Magnitnaya Gidrodinamika*, **3**, pp. 134-137.
- Berd, R.B., Stewart, W.E., Lightfoot, E.N., 1965 *Transport Phenomena*, New York, John Wiley & Sons.
- Beschkov, V., Boyadjiev, Chr., Peev, G., 1978, On the mass transfer into a falling laminar film with dissolution, *Chem. Eng. Sci.*, **33**, pp. 65-69.
- Beschkov, V., Boyadjiev Chr., 1978, Wave effect on mass transfer in liquid films, *Izv. Khim. Bolg. AN*, **11**, 2, pp. 209-215.
- Besedin, S.M., 1978, Experimental methods for studying the wave flow of thin liquid films, in *Physical Hydrodynamics and Heat Transfer* (in Russian), IT SO AN SSSR, Novosibirsk, pp. 17-21.

- Besedin, S.M., Pokusaev, B.G., 1983, Liquid film falling into another liquid, in *Hydrodynamic Flow and Wave Processes* (in Russian), IT SO AN SSSR, Novosibirsk, pp. 55-62.
- Besedin, S.M., Tsvelodub, O.Yu., 1984, Neutral waves on the surface of liquid film flowing along the vertical wall into another liquid (in Russian), *Zhurn. Prikl. Mekh. Tekhn. Fiz.*, 1, pp. 29-34.
- Boyadjiev, Chr., Beschkov, V., 1984, *Mass Transfer in Liquid Film Flows*, Sofia, Publishing House of the Bulgarian Academy of Sciences.
- Brauer, H., 1956, Strömung und Wärmeübergang bei rieselfilmen, *VDI-Forsch.*, 22, 457, p. 40.
- Braun, D., Eckstein, H., Hiby, J.W., 1971, Messung der Oberflächengeschwindigkeit von Rieselfilmen, *Chem. And. Techn.*, 43, 6, p. 324.
- Brauner, N., Maron, D.M., 1982, Characteristics of inclined thin films, waviness and the associated mass transfer, *Int. J. Heat Mass Transfer*, 25, 1, pp. 99-100.
- Budov, V.M., Shemagin, I.A., 1982, Effect of phase transition reactive force on the development of convective instability at film condensation (in Russian), *Izv. Vuzov SSSR. Energetika*, 10, pp. 66-69.
- Buevich, Yu.A., Kudymov, S.V., 1983, Stationary long waves in a liquid film on an inclined plane (in Russian), *Zhurn. Prikl. Mekh. Tekhn. Fiz.*, 1, pp. 15-20.
- Buevich, Yu.A., Kudymov, S.V., 1984, Mass transfer in a thin liquid film in stationary wave regime (in Russian), *Inzh.-Fiz. Zhurn.*, 46, 5, pp. 736-745.
- Bufetov, N.S., 1981, *Experimental Study of Joint Heat and Mass Transfer at Absorption on a Vertical Liquid Film* (in Russian), Ph. D. Thesis, IT SO AN SSSR, Novosibirsk.
- Bunov, A.V., Demekhin, E.A., Shkadov, V.Ya., 1984, On nonunique nature of nonlinear wave solutions in a viscous layer (in Russian), *Prikl. Mat. Mekh.*, 48, 4, pp. 691-696.
- Bunov, A.V., Demekhin, E.A., Shkadov, V.Ya., 1986, Bifurcation of solitary waves in a falling liquid layer (in Russian), *Vestnik MGU. Ser. mat. mekh.*, 2, pp. 76-78.
- Burdakov, A.P., Bufetov, N.S., Dorokhov, A.R., 1979, Absorption on a falling liquid film (in Russian), *Izv. SO AN SSSR. Ser. tekhn. nauk*, 13, 3, pp. 48-52.
- Carasso, A., Shen, M.-C., 1977, On viscous fluid flow down an inclined plane and the development of roll waves, *SIAM J. Appl. Math.*, 33, 3, pp. 399-426.
- Cerro, R., Whitaker, S., 1971, Stability of falling liquid films, *Chem. Eng. Sci.*, 26, 5, p. 785.
- Chang, H.-C., 1987, Evolution of nonlinear waves on vertically falling films - a normal form analysis, *Chem. Eng. Sci.*, 42, 3, pp. 515-533.
- Chang, H.-C., 1989, Onset of nonlinear waves on falling films, *Phys. Fluids A.*, 1, 8, pp. 1314-1327.

- Chen, L.-H., and Chang, H.-C., 1986, Nonlinear waves on liquid film surface-II. Bifurcation analyses of the long-wave equation, *Chem. Eng. Sci.*, **41**, 10, pp. 2477-2486.
- Chernobylsky, I.I., Vorontsov, E.G., 1968, Hydrodynamics and heat transfer to flooding liquid film at its gravitational flow along the vertical surface of heat transfer, in *Heat and Mass Transfer* (in Russian), M., Energiya, **1**, pp. 259-266.
- Chu, K.J., Dukler, A.E., 1974, Statistical characteristics of thin wave films, *AIChE J.*, **20**, 4, pp. 695-706.
- Chu, K.J., Dukler, A.E., 1975, Statistical characteristics of thin wave films, *AIChE J.*, **21**, 3, pp. 583-593.
- Chun, K.R., Seban, R.A., 1971, Heat transfer to evaporating liquid films, *J. Heat Transfer*, **93**, 4, pp. 391-396.
- Cook, R.A., Clark, R.H., 1971, The experimental determination of velocity profiles in smooth falling liquid films, *Can. J. Chem. Eng.*, **49**, 3, pp. 412-416.
- Craik, A.D.D., Latham, R.C., Fawkes, M.J., Gibbon, P.W.F., 1981, The circular hydraulic jump, *J. Fluid Mech.*, **112**, pp. 347-362.
- Cravarolo, L., Giorgini, A., Hassid, A., Pedrocchi, E., 1964, *A device for the measurement of shear stress on the wall of a conduit - its application in the mean density determination in two-phase flow shear stress data in two-phase adiabatic vertical flow*, CISE (Milan), Report No. R-82.
- Davidson, J.F., Cullen, E.J., 1957, The determination of diffusion coefficients for sparingly soluble gases in liquids, *Trans. Inst. Chem. Eng.*, **35**, pp. 51-60.
- Demekhin, E.A., Kaplan, M.A., 1989, On stability of stationary travelling waves on a surface of vertically falling layer of viscous fluid (in Russian), *Izv. AN SSSR. Mekh. Zhidk. Gaza*, 3, pp. 33-41.
- Demekhin, E.A., Kaplan, M.A., Shkadov, V.Ya., 1987, On mathematical models for theory of thin viscous fluid layers (in Russian), *Izv. AN SSSR. Mekh. Zhidk. Gaza*, 6, pp. 73-81.
- Demekhin, E.A., Tokarev, G.Yu., Shkadov, V.Ya., 1987, Two-dimensional nonstationary waves on a vertical liquid film (in Russian), *Teor. Osnovy Khim. Tekhn.*, **21**, 2, pp. 177-183.
- Demekhin, E.A., Tokarev, G.Yu., Shkadov, V.Ya., 1988, Numerical modelling of three-dimensional wave evolution in a falling layer of viscous fluid (in Russian), *Vest. MGU. Ser. mat.-mekh.*, 2, pp. 50-54.
- Demekhin, E.A., Shkadov, V.Ya., 1981, On stationary waves in a layer of viscous fluid (in Russian), *Izv. AN SSSR. Mekh. Zhidk. Gaza*, 3, pp. 151-154.
- Demekhin, E.A., Shkadov, V.Ya., 1984, On three-dimensional nonstationary waves in a falling liquid film (in Russian), *Izv. AN SSSR. Mekh. Zhidk. Gaza*, 5, pp. 21-27.
- Demekhin, E.A., Shkadov, V.Ya., 1985a, Regimes of two-dimensional waves of a thin layer of viscous fluid (in Russian), *Izv. AN SSSR. Mekh. Zhidk. Gaza*, 3, pp. 63-67.

- Demekhin, E.A., Shkadov, V.Ya., 1985b, On solitons in dissipative media, in *Hydrodynamics and Heat and Mass Transfer of Liquid Flows with a Free Surface* (in Russian), IT SO AN SSSR, Novosibirsk, pp. 32-48.
- Dengler, C.E., Addoms, J.N., 1956, Heat transfer mechanism for vaporization of water in a vertical tube, *Chem. Eng. Prog. Symp. Series*, **52**, p. 95.
- Dukler, A.E., Berglin, O.P., 1952, Characteristics of flow in falling liquid films, *Chem. Eng. Prog.*, **48**, p. 558.
- Elukhin, V.A., Kholpanov, L.P., 1989, Self-organization, small mode chaos and multimode turbulence in unstable systems of chemical technology (in Russian), *Teor. Osnovy Khim. Tekhn.*, **23**, 6, pp. 741-752.
- Emmert, R.E., Pigford, R.L., 1954, A study of gas absorption on falling liquid films, *Chem. Eng. Progr.*, **50**, 2, pp. 87-93.
- Frisk, D.P., Davis, E.J., 1972, The enhancement of heat transfer by waves in stratified gas-liquid flow, *Int. J. Heat Mass Transfer*, **15**, pp. 1537-1552.
- Fujita, T., Ueda, T., 1978, Heat transfer to falling liquid films and film breakdown. Saturated liquid films with nucleate boiling, *Int. J. Heat Mass Transfer*, **28**, pp. 109-118.
- Fukano, T., Sekoguchi, K., Nishikawa, K., 1971, *Characteristics of State Pressure Fluctuation in Upward Air-Water Two-Phase Flow*, Technology Report of Kyushu University, **44**, 4, pp. 594-601.
- Fukano, T., Ousaka, A., 1989, Prediction of the circumferential distribution of film thickness in horizontal and near-horizontal gas-liquid annular flows, *Int. J. Multiphase Flow*, **15**, 3, pp. 403-419.
- Fulford, G.D., 1962, Ph. D. Thesis. Univ. Birmingham.
- Fulford, G.D., 1964, The flow of liquids in thin films, *Advan. Chem. Eng.*, **5**, pp. 151-236.
- Ganchev, B.G., Kozlov, V.M., 1973, Investigation into gravitational flow of liquid film along the walls of vertical channel with large length (in Russian), *Zhurn. Prikl. Mekh. Tekh. Fiz.*, 1, pp. 128-135.
- Ganchev, B.G., Kozlov, V.M., Lozovetsky, V.V., Nikitin, V.M., 1970, Experimental study of hydrodynamics of liquid films falling down the vertical surfaces under the gravity effect (in Russian), *Izv. Vuzov SSSR. Mashinostroyeniye*, 2, pp. 75-80.
- Ganchev, B.G., Kozlov, V.M., Orlov, V.V., 1972, Some results of investigation into liquid film flow by stroboscopic visualization method (in Russian), *Zhurn. Prikl. Mekh. Fiz.*, 2, pp. 140-143.
- Gaster, M., 1962, A note on the relation between temporally increasing and spatially increasing disturbances in hydrodynamic stability, *J. Fluid Mech.*, **14**, pp. 222-224.
- Geshev, P.I., Ezdin, B.S., 1985, Calculation of velocity profile and wave shape on falling liquid film, in *Hydrodynamics and Heat and Mass Transfer of Liquid Flows with a Free Surface* (in Russian), IT SO AN SSSR, Novosibirsk, pp. 49-58.

- Geshev, P.I., Lapin, A.M., 1983, Diffusion of dilute gas in falling wavy liquid films (in Russian), *Zhurn. Prikl. Mekh. Tekh. Fiz.*, 6, pp. 106-112.
- Geshev, P.I., Lapin, A.M., Tsvetodub, O.Yu., 1985, Heat and mass transfer in wavy falling liquid films, in *Hydrodynamics and Heat and Mass Transfer of Liquid Flows with a Free Surface* (in Russian), IT SO AN SSSR, Novosibirsk, pp. 102-119.
- Gimbutis, G., 1988, *Heat Transfer in Gravitational Flow of Liquid Film* (in Russian), Vilnius, Mokslas, 232 p.
- Gjevik, B., 1970, Occurrence of finite-amplitude surface waves on falling liquid films, *Phys. Fluids*, 13, 8, pp. 1918-1925.
- Gjevik, B., 1971, Spatially varying finite-amplitude wave trains on falling liquid films, *Acta Polytechnica Scand.*, 61, pp. 1-16.
- Gogonin, I.I., Dorokhov, A.R., Sosunov, V.I., 1978, Heat transfer at film condensation of quiescent vapour on a vertical surface (in Russian), *Inzh.-Fiz. Zhurn.*, 35, 6, pp. 1050-1058.
- Gogonin, I.I., Dorokhov, A.R., Sosunov, V.I., 1980, *Heat Transfer at Film Condensation of Quiescent Vapour* (in Russian), Preprint No 48-80, IT SO AN SSSR, Novosibirsk.
- Goncharenko, B.I., Urintsev, A.L., 1975, On stability of viscous fluid flow on an inclined plane (in Russian), *Zhurn. Prikl. Mekh. Tekh. Fiz.*, 2, pp. 172-173.
- Gorshkov, A.S., Semenov, P.A., Tsirlin, A.M., Galiullin, M.F., 1969, Investigation of dilute gas absorption in thin liquid layers (in Russian), *Teor. Osnovy Khim. Tekhn.*, 3, 2, pp. 209-215.
- Govan, A.H., Hewitt, G.F., Owen, D.G., Burnett, G., 1989, Wall shear stress measurements in vertical air-water annular two-phase flow, *Int. J. Multiphase Flow*, 15, 3, pp. 307-325.
- Graebel, W.P., 1960, The stability of stratified flow, *J. Fluid Mech.*, 8, 3, pp. 321-336.
- Graetz, L., 1885, Über die Wärmeleitfähigkeit von Flüssigkeiten, *Annalen der Physik*, 25, pp. 337-357.
- Grigoryan, G., 1963, Some aspects of dynamics of liquid jets falling down a solid surface, *Proceed. Azerbaijan Research Institute of Agriculture Electrification*, 1, pp. 7-15.
- Grimley, S.S., 1945, Liquid flow conditions in packed towers, *Trans. Instn. Chem. Engrs.*, 23, pp. 228-235.
- Grossman, G., 1983, Simultaneous heat and mass transfer in film absorption under laminar flow, *Int. J. Heat Mass Transfer*, 26, 3, pp. 357-371.
- Grossman, G., Heath, M.T., 1984, Simultaneous heat and mass transfer in absorption of gases in turbulent liquid films, *Int. J. Heat Mass Transfer*, 27, 12, pp. 2365-2376.
- Gyure, D.C., Krantz, W.B., 1983, Laminar film flow over a sphere, *Ind. Eng. Chem. Fundam.*, 22, pp. 405-410.

- Hagiwara, Y., 1989, Numerical analysis of 3-D interfacial shape and velocity distribution of liquid film, *Phys.-Chem. Hydrodynamics*, **11**, 1, pp. 49-62.
- Hagiwara, Y., Esmaeilzadeh, E., Tsutsui, T., Suzuki, K., 1989, Simultaneous measurement of liquid film thickness, wall shear stress and gas flow turbulence of horizontal wavy two-phase flow, *Int. J. Multiphase Flow*, **15**, 3, pp. 421-431.
- Hanratty, T.J., Campbell, J.A., 1983, Measurement of wall shear stress, in *Fluid Mechanics Measurements*, Hemisphere, Washington, D.C., pp. 559-617.
- Henstock, W.H., Hanratty, T.J., 1979, Gas absorption by a liquid layer flowing on the wall of a pipe, *AIChE J.*, **25**, pp. 122-131.
- Hewitt, G.F., 1978, *Measurement of Two-phase Flow Parameters*, London, Academic Press.
- Hewitt, G.F., Hall-Taylor, N.S., 1970, *Annular Two-phase Flow*, Oxford, Pergamon Press.
- Hewitt, G.F., King, R.D., Lovegrove, P.C., 1964, Liquid film and pressure drop studies, *Chem. Proc. Eng.*, **45**, p. 191.
- Hewitt, G.F., Lovegrove, P.C., 1962, *The application of the light absorption technique to continuous film thickness recording in annular two-phase flow*, AERE-R 3953.
- Hewitt, G.F., Lovegrove, P.C., Nicholls, B., 1964, *Film thickness measurement using a fluorescence technique. Pt. 1. Description of the method*, AERE-R 4478.
- Higbie, R., 1935, The rate of absorption of a pure gas into a still liquid during short periods of exposure, *Trans. Amer. Inst. Chem. Eng.*, **31**, p. 365.
- Hirkox, C.E., 1971, Instability due to viscosity and density stratification in axisymmetric pipe flow, *Phys. Fluids*, **14**, 2, pp. 251-262.
- Hirshburg, R.I., Florschuetz, L.W., 1982, Laminar wavy-film flow. Pt. 2. Condensation and evaporation, *Trans. ASME: J. Heat Transfer*, **104**, 8, pp. 459-464.
- Ho, F.C.K., Hummel, R.L., 1970, Average velocity distributions within falling liquid films, *Chem. Eng. Sci.*, **25**, pp. 1225-1237.
- Hwang, C.-C., Weng, C.-I., 1988, Non-linear stability analysis of film flow down a heated or cooled inclined plane with viscosity variation, *Int. J. Heat Mass Transfer*, **31**, 9, pp. 1775-1784.
- Iribarne, A., Gosman, A.D., Spalding, D.B., 1967, A theoretical and experimental investigation of diffusion - controlled electrolytic mass transfer between a falling liquid film and a wall, *Int. J. Heat Mass Transfer*, **10**, pp. 1661-1676.
- Ishigai, S., Nakanisi, S., Koizumi, T., Oyabi, Z., 1972, Hydrodynamics and heat transfer of vertical falling liquid films, *Bull. JSME*, **15**, 83, pp. 594-602.
- Ishihara, T., Iwagaki, Y., Iwasa, Y., 1961, *Trans. Amer. Soc. Civil Eng.*, **126**, Pt. 1, pp. 548-563.

- Ito, R., Tomura, K., 1979a, Velocity profile in "calming zone" of falling liquid films on inclined plates, *J. Chem. Eng. Jap.*, **12**, 1, pp. 10-13.
- Ito, R., Tomura, K., 1979b, Thickness of liquid falling films in "calming zone" on inclined plates, *J. Chem. Eng. Jap.*, **12**, 1, pp. 66-68.
- Ivansky, A.P., 1980, On nonlinear waves in vertical film flow (in Russian), *Zhurn. Prikl. Mech. Tekh. Fiz.*, 2, pp. 52-58.
- Jackson, M.L., 1955, Liquid films in viscous flow, *AICHE J.*, **1**, 1, p. 231.
- Javdani, K., 1974, Mass transfer in wavy liquid films, *Chem. Eng. Sci.*, **29**, p. 61.
- Javdani, K., Goren, S., 1971, Finite-amplitude wavy flow of thin films, *Progress in Heat and Mass Transfer*, **6**, pp. 253-262.
- Jepsen, J., Crosser, O., Perry, R., 1969, The effect of wave induced turbulence on the rate of absorption of gases in falling liquid films, *AICHE J.*, **12**, 1, pp. 186-192.
- Jones, L.O., Whitaker, S., 1966, An experimental study of falling liquid films, *AICHE J.*, **12**, 3, pp. 525-529.
- Jurman, L.A., McCready, M.J., 1989, Study of waves on thin liquid films sheared by turbulent gas flows, *Phys. Fluids A.*, **1**, 3, pp. 522-536.
- Kachanov, Yu.S., Kozlov, V.V., Levchenko, V.Ya., 1982, *Turbulence Generation in a Boundary Layer* (in Russian), Novosibirsk, Nauka, 153 p.
- Kapitza, P.L., 1948, Wave flow of thin layer of viscous fluid (in Russian), *Zhurn. Eksper. Teor. Fiz.*, **18**, 1, pp. 3-28.
- Kapitza, P.L., 1951, Thermal conductivity and diffusion in a liquid medium with periodic flow (in Russian), *Zhurn. Eksper. Teor. Fiz.*, **21**, p. 964.
- Kapitza, P.L., Kapitza, S.P., 1949, Wave flow of thin layers of viscous fluid (in Russian), *Zhurn. Eksper. Teor. Fiz.*, **19**, 2, pp. 105-120.
- Karapantsios, T.D., Paras, S.V., Karabelas, A.J., 1989, Statistical characteristics of free falling films at high Reynolds numbers, *Int. J. Multiphase Flow*, **15**, 1, pp. 1-21.
- Karapantsios, T.D., Karabelas, A.J., 1990, Surface characteristics of roll waves on free falling films, *Int. J. Multiphase Flow*, **16**, 5, pp. 835-852.
- Kheshgi, H.S., Scriven, L.E., 1987, Disturbed film flow on a vertical plate, *Phys. Fluids*, **30**, pp. 990-997.
- Kholostykh, V.I., Blyakher, I.G., Shekhtman, A.A., 1972, Flow of liquid film along a vertical surface (in Russian), *Inzh.-Fiz. Zhurn.*, **22**, 3, pp. 494-498.
- Kholpanov, L.P., 1987, Heat and mass transfer and hydrodynamics of film liquid flow (in Russian), *Teor. Osnovy Khim. Tekhn.*, **21**, 1, p. 86.
- Kholpanov, L.P., Shkadov, V.Ya., 1990, *Hydrodynamics and Heat and Mass Transfer from Interface* (in Russian), M., Nauka, 272 p.

- Kholpanov, L.P., Shkadov, V.Ya., Malyusov, V.A., Zhavoronkov, N.M., 1967, On mass transfer in a liquid film at wave formation (in Russian), *Teor. Osnovy Khim. Tekhn.*, 1, 1, pp. 73-79.
- Kholpanov, L.P., Shkadov, V.Ya., Malyusov, V.A., Zhavoronkov, N.M., 1976, Investigation of hydrodynamics and mass transfer in a liquid film with allowance for inlet section (in Russian), *Teor. Osnovy Khim. Tekhn.*, 10, 5, pp. 659-669.
- Konobeev, B.I., Malyusov, V.A., Zhavoronkov, N.M., 1961, Investigation of film absorption at high gas velocities (in Russian), *Khim. Prom.*, 7, pp. 475-481.
- Kramers, H., Kreyger, P.J., 1956, Mass transfer between a flat surface and falling liquid film, *Chem. Eng. Sci.*, 6, p. 42.
- Krantz, W.B., Goren, S.L., 1970, Finite-amplitude, long waves on liquid films flowing down a plane, *Ind. Eng. Chem. Fundam.*, 9, 1, pp. 107-113.
- Krantz, W.B., Goren, S.L., 1971, Stability of thin liquid films flowing down a plane, *Ind. Eng. Chem. Fundam.*, 10, 1, pp. 91-101.
- Krasny, Yu.P., Miko, V.V., 1985, Nonlinear waves on the surface of freely falling vertical liquid film (in Russian), *Inzh.-Fiz. Zhurn.*, 48, 3, pp. 375-381.
- Krishna, M.V.G., Lin, S.P., 1977, Nonlinear stability of a viscous film with respect to three-dimensional side - band disturbances, *Phys. Fluids*, 20, 7, pp. 1039-1044.
- Krylov, V.S., Vorotylin, V.P., Levich, V.G., 1969, On theory of wave motion of thin liquid films (in Russian), *Teor. Osnovy Khim. Tekhn.*, 3, 4, pp. 499-507.
- Kulov, N.N., Malyusov, V.A., 1967, Mass transfer in a tube with flooded wall at liquid film mixing (in Russian), *Teor. Osnovy Khim. Tekhn.*, 1, 2, pp. 213-223.
- Kulov, N.N., Muravyev, M.Yu., Malyusov, V.A., Zhavoronkov, N.M., 1982, Velocity profile in falling liquid films (in Russian), *Teor. Osnovy Khim. Tekhn.*, 16, 4, pp. 499-509.
- Kutateladze, S.S., 1979, *Fundamentals of Heat Transfer Theory* (in Russian), M., Atomizdat.
- Kutateladze, S.S., 1982, Semi-empirical theory of film condensation of pure vapours, *Int. J. Heat Mass Transfer*, 25, 5, pp. 653-660.
- Landau, L.D., 1944, On turbulence problem (in Russian), *Dokl. AN SSSR*, 44, 4, pp. 339-342.
- Landau, L.D., Lifshits, E.M., 1954, *Continuum Mechanics* (in Russian), M., Gostekhizdat.
- Lescovar, B., Sun, R.K., Koble, W.F., Turko, B., 1979, *Measurement of the thickness of liquid film by means of capacitance method*, EPRI Rep. NP-1212.
- Levich, V.G., 1959, *Physico-Chemical Hydrodynamics* (in Russian), M., Fizmatgiz.
- Leveque, M.A., 1928, Les lois de la transmission de la chaleur par convection, *Annals*

- Mines Belg.*, **13**, p. 201.
- Lighthill, J., 1978, *Waves in Fluids*, Cambridge, University Press.
- Lilleleht, L.U., Hanratty, T.J., 1961, Relation of interfacial shear stress to the wave height for concurrent air-water flow, *AICHE J.*, **7**, pp. 548-560.
- Limberg, H., 1973, Wärmeübergang an turbulente und laminare Rieselfilme, *Int. J. Heat Mass Transfer*, **16**, 9, pp. 1691-1702.
- Lin, S.P., 1967, Instability of liquid film down an inclined plane, *Phys. Fluids*, **10**, 2, pp. 308-313.
- Lin, S.P., 1974, Finite-amplitude side-band stability of a viscous film, *J. Fluid Mech.*, **63**, pp. 417-429.
- Lin, S.P., 1975, Stability of liquid flow down a heated inclined plane, *Letters in Heat and Mass Transfer*, **2**, 5, pp. 361-370.
- Lin, S.P., 1983, Film waves. *Waves Fluid Interface, Proc. Symp., Madison, Wisc.*, 18-20 Oct., 1982, New York, pp. 261-289.
- Maron, D.M., Brauner, N., Hewitt, G.F., 1989, Flow patterns in wavy thin films: numerical simulation, *Int. Comm. Heat Mass Transfer*, **16**, pp. 655-666.
- Marshall, E., 1975, Das Messen charakterischer Eigenschaften von Rieselfilmen, *Chem. Ing. Techn.*, **47**, 21, pp. 879-882.
- Marshall, E., Lee, C.Y., 1973, Stability of condensate flow down a vertical wall, *Int. J. Heat Mass Transfer*, **16**, 1, pp. 41-49.
- Marshall, B.W., Tiederman, W.G., 1972, A capacitance depth gauge for thin liquid films, *Rev. Sci. Instrum.*, **43**, pp. 344-347.
- Martin, C.J., 1983, *Annular two-phase flow*, Ph. D. Thesis, Oxford Univ.
- Mayer, P.G., 1959, Roll waves and slug flows in inclined open channels, *J. Hydr. Div. Proc. Amer. Soc. Civ. Eng.*, **89**, p. 99.
- Maurin, L.N., Sorokin, V.S., 1962, On wave flow of thin layers of viscous fluid (in Russian), *Zhurn. Prikl. Mekh. Tekhn. Fiz.*, **4**, pp. 60-67.
- Maurin, L.N., Tochigin, A.A., 1979, Solitons on falling liquid film (in Russian), *J. Appl. Mech. Techn. Phys.*, **4**, pp. 47-54.
- Mitchell, J.E., Hanratty, T.J., 1966, A study of turbulence at a wall using an electrochemical wall shear stress meter, *J. Fluid Mech.*, **26**, p. 199.
- Myasnikov, S.K., Kulov, N.N., Malyusov, V.A., Zhavoronkov, N.M., 1972, Effective velocity of free surface motion for a falling liquid film (in Russian), *Teor. Osnovy Khim. Tekhn.*, **6**, 6, pp. 893-899.
- Nakaya, C., 1975, Long waves on thin fluid layer flowing down an incline plane, *Phys. Fluids*, **18**, pp. 1407-1412.
- Nakaya, C., 1977, Waves of large amplitude on a fluid film down a vertical wall, *J.*

- Phys. Soc. Jap.*, **43**, 5, pp. 1821-1822.
- Nakaya, C., 1989, Waves on a viscous fluid film down a vertical wall, *Phys. Fluids. A.*, **1**, 7, pp. 1143-1154.
- Nakoryakov, V.E., Alekseenko, S.V., 1980, Waves on liquid film falling down an inclined surface, in *Wave processes in two-phase media* (in Russian), IT SO AN SSSR, Novosibirsk, pp. 64-79.
- Nakoryakov, V.E., Burdukov, A.P., Bufetov, N.S., Grigoryeva, N.I., Dorokhov, A.P., 1980, Experimental study of nonisothermal absorption of falling liquid film (in Russian), *Teor. Osnovy Khim. Tekhn.*, **14**, 5, pp. 755-758.
- Nakoryakov, V.E., Burdukov, A.P., Kashinsky, O.N., Geshev, P.I., 1986, *Electrodiffusion Method of Investigation into the Local Structure of Turbulent Flows* (in Russian), IT SO AN SSSR, Novosibirsk, 248 p.
- Nakoryakov, V.E., Burdukov, A.P., Pokusaev, B.G. et al., 1973, *Investigation into Turbulent Flows of Two-Phase Media* (in Russian), IT SO AN SSSR, Novosibirsk, 315 p.
- Nakoryakov, V.E., Grigoryeva, N.I., 1977, On joint heat and mass transfer at absorption on droplets and films (in Russian), *Inzh.-Fiz. Zhurn.*, **32**, 3, pp. 399-405.
- Nakoryakov, V.E., Grigoryeva, N.I., 1980, Calculation of heat and mass transfer under nonisothermal absorption at the initial region of falling film (in Russian), *Teor. Osnovy Khim. Tekhn.*, **14**, 4, pp. 483-488.
- Nakoryakov, V.E., Pokusaev, B.G., Alekseenko, S.V., 1976, Stationary two-dimensional rolling waves on a vertical liquid film (in Russian), *Inzh.-Fiz. Zhurn.*, **30**, 5, pp. 780-785.
- Nakoryakov, V.E., Pokusaev, B.G., Alekseenko, S.V., 1983, Wave effect on desorption of carbon dioxide from falling liquid films (in Russian), *Teor. Osnovy Khim. Tekhn.*, **17**, 3, pp. 307-312.
- Nakoryakov, V.E., Pokusaev, B.G., Alekseenko, S.V., Orlov, V.V., 1977, Instantaneous velocity profile in a wavy liquid film (in Russian), *Inzh.-Fiz. Zhurn.*, **33**, 3, pp. 399-405.
- Nakoryakov, V.E., Pokusaev, B.G., Radev, K.B., 1985, Wave effect on convective gas diffusion in a falling liquid film, in *Hydrodynamics and Heat and Mass Transfer of Liquid Flows with a Free Surface* (in Russian), IT SO AN SSSR, Novosibirsk, pp. 5-32.
- Nakoryakov, V.E., Pokusaev, B.G., Radev, K.B., 1987, Waves and their effect on convective gas diffusion in falling liquid films (in Russian), *Zhurn. Prikl. Mekh. Tekh. Fiz.*, 3, pp. 95-104.
- Nakoryakov, V.E., Pokusaev, B.G., Troyan, E.N., Alekseenko, S.V., 1975, Flow of thin liquid films, in *Wave Processes in Two-Phase Systems* (in Russian), IT SO AN SSSR, Novosibirsk, pp. 129-206.
- Nakoryakov, V.E., Pokusaev, B.G., Khristoforov, V.V., Alekseenko, S.V., 1974, Experimental study of liquid film flow along the vertical wall (in Russian), *Inzh.-Fiz. Zhurn.*, **27**, 3, pp. 397-401.

- Nakoryakov, V.E., Pokusaev, B.G., Shreiber, I.R., 1993, *Wave Propagation in Gas-Liquid Media*, CRC Press, London, Tokyo, 222 p.
- Nakoryakov, V.E., Pokusaev, B.G., Troyan, E.N., 1978, Impingement of an axisymmetric liquid jet on a barrier, *Int. J. Heat Mass Transfer*, **21**, pp. 1175-1184.
- Nakoryakov, V.E., Shreiber, I.R., 1973, Waves on the surface of a thin liquid layer (in Russian), *Zhurn. Prikl. Mekh. Tekh. Fiz.*, 2, pp. 109-113.
- Nepomnyashchy, A.A., 1974a, Stability of wave regimes in a film falling down an inclined plane (in Russian), *Izv. AN SSSR. Mekh. Zhidk. Gaza*, 3, pp. 28-33.
- Nepomnyashchy, A.A., 1974b, Stability of wave regimes in a liquid film with respect to three-dimensional perturbations (in Russian), *Gidrodinamika*, 5, pp. 91-104.
- Nepomnyashchy, A.A., 1974c, Three-dimensional spatially periodical motions in a liquid film falling down a vertical plane (in Russian), *Gidrodinamika*, 7, pp. 43-52.
- Nepomnyashchy, A.A., 1977, Stability of wave motions in a layer of viscous fluid on an inclined plane (in Russian), *Nonlinear Wave Processes in Two-Phase Media*, IT SO AN SSSR, Novosibirsk, pp. 181-190.
- Nigmatulin, B.I., Vinogradov, L.A., Vinogradov, V.A., Kurbanov, Sh.E., 1982, Technique for measuring thickness and wave characteristics of liquid film surface in a vapour-water dispersion-annular flow (in Russian), *Teplofizika Vysokikh Temperatur*, **20**, 6, pp. 1145-1152.
- Nusselt, W., 1916, Die Oberflächenkondensation des Wasserdampfes, *Zeitschrift VDI*, **60**, pp. 541-546.
- Olsson, R.G., Turkdogan, E.T., 1966, Radial spread of liquid stream on a horizontal plate, *Nature*, **211**, 5051, pp. 813-816.
- Osypov, V.Z., 1970, Stability in motion of two nonmixing viscous fluids between the parallel walls, *Proceed. VTs AN GSSR*, **9**, 3.
- Pakhaluev, V.M., Sheinkman, A.G., 1974, Investigation into statistic characteristics of the wave flow of liquid films (in Russian), *Inzh.-Fiz. Zhurn.*, **27**, 5, pp. 845-849.
- Penev, V., Krylov, V.S., Boyadjiev, Chr., Vorotilin, V.P., 1972, Wavy flow of thin liquid films, *Int. J. Heat Mass Transfer*, **15**, 7, p. 1395.
- Petriashvili, V.I., Tsvetodub, O.Yu., 1978, Horseshoe solitons on a falling liquid film (in Russian), *Dokl. AN SSSR*, **238**, 6, pp. 1321-1323.
- Pierson, F.W., Whitaker, S., 1977, Some theoretical and experimental observations of the wave structure of falling films, *Ind. Eng. Chem. Fundam.*, **16**, 4, pp. 401-408.
- Pokusaev, B.G., Malkov, V.A., Alekseenko, S.V., Besedin, S.M., 1978, *Experimental Study of the Operation of Conductivity Sensor in the Case of Wave Flow of Liquid Film*, Report IT SO AN SSSR, Novosibirsk, 39 p.
- Portalski, S., 1964, Eddy formation in film flow down a vertical plate, *Ind. Eng. Chem. Fundam.*, **3**, 1, pp. 49-53.

- Portalski, S., Clegg, A.J., 1972, An experimental study of wave inception on falling liquid films, *Chem. Eng. Sci.*, **27**, pp. 1257-1265.
- Prokopiou, T., Cheng, M., Chang, H.-C., 1991, Long waves on inclined films at high Reynolds number, *J. Fluid Mech.*, **222**, pp. 665-691.
- Pukhnachev, V.V., 1975, On theory of rolling waves (in Russian), *Zhurn. Prikl. Mekh. Tekh. Fiz.*, **5**, pp. 47-58.
- Pumir, A., Manneville, P., Pomeau, Y., 1983, On solitary waves running down an inclined plane, *J. Fluid Mech.*, **135**, pp. 27-50.
- Radev, K.B., 1983, *Conductometric method of studying mass transfer processes between phases in gas-liquid flows. Heat and mass transfer in single- and two-phase systems* (in Russian), IT SO AN SSSR, Novosibirsk, pp. 14-23.
- Radev, K.B., 1989, *Wave Effect on Heat and Mass Transfer at Film Condensation* (in Russian), Preprint No 9, ITMO AN BSSR, Minsk, 16 p.
- Ramm, V.M., 1966, *Gas Absorption* (in Russian), M., Khimiya, 1966, 768 p.
- Rao, V.V., Olev, T., 1964, Mass transfer from a flat surface to an impinging turbulent jet, *Can. J. Chem. Eng.*, **42**, 3, pp. 95-99.
- Rifert, V.G., 1980, Heat transfer at vapour formation in a liquid film falling down a vertical shaped surface (in Russian), *Inzh.-Fiz. Zhurn.*, **39**, 5, pp. 833-837.
- Rogovaya, I.A., Olevsky, V.M., Runova, N.G., 1969, Measurement of parameters of film wave flow on a vertical plate (in Russian), *Teor. Osnovy Khim. Tekhn.*, **3**, 2, pp. 200-208.
- Rosenau, P., Oron, A., 1989, Evolution and breaking of liquid film flowing on a vertical cylinder, *Phys. Fluids A.*, **1**, 11, pp. 1763-1766.
- Roskes, G.J., 1970, Three-dimensional long waves on a liquid film, *Phys. Fluids.*, **13**, 6, pp. 1440-1445.
- Rotem, Z., Neilson, J., 1969, Exact solution for diffusion to flow down an incline, *Can. J. Chem. Eng.*, **47**, pp. 341-346.
- Roy, R.P., Jain, S., 1989, A study of thin water film flow down an inclined plate without and with countercurrent air flow, *Exp. Fluids.*, **7**, pp. 318-328.
- Ryzhkov, S.V., Miroshnichenko, V.N., 1972, Investigation into the flow of laminar liquid film on an inclined plate under the gravity effect (in Russian), *Sudostroenie i morskie sooruzheniya*, **19**, pp. 116-121.
- Salazar, R.P., Marschall, E., 1978, Statistical properties of the thickness of a falling liquid film, *Acta Mechanica*, **29**, pp. 239-255.
- Schlichting, H., 1965, *Grenzschicht - Theorie*, Karlsruhe, Verlag G. Braun.
- Seban, R., Faghri, A., 1978, Wave effects on the transport to falling laminar liquid films, *Trans. ASME. J. Heat Transfer*, **100**, 1.

- Semenova, I.P., 1978, *Mass transfer intensification by waves on the interphase surface at separate flow of a gas-liquid mixture*, Account N 2077, Research Institute Mekh. MGU, Moscow.
- Semenova, I.P., Yakubenko, A.E., 1983, Stationary wave regimes in a falling film of viscous fluid (in Russian), *Izv. AN SSSR. Mekh. Zhidk. Gaza*, 3, pp. 16-27.
- Sen', L.I., Tye, A.M., Tsvelodub, O.Yu., 1983, Model of film liquid flow along confusor surface (in Russian), *Zhurn. Prikl. Mekh. Tekh. Fiz.*, 3, pp. 49-52.
- Sergeev, A.D., Kholpanov, L.P., Nikolaev, N.A., Malyusov, V.A., Zhavoronkov, N.M., 1975, Measurement of wave characteristics of film flow by the method of local electric conduction (in Russian), *Inzh.-Fiz. Zhurn.*, 29, 5, p. 843.
- Sergeev, G.I., Kovalenko, V.P., 1980, Investigation into heat and mass transfer in film apparatus at low-frequency perturbations of interface, in *Tepломассообмен VI* (in Russian), Vol. III, Minsk, pp. 166-175.
- Sexauer, T., 1939. Der Wärmeübergang am senkrechten berieselten, *Rohr. Forsch. Ing. Wes.*, 10, 6, pp. 286-296.
- Shach, W., 1935, Umlenkung eines kreisförmigen flüssigkeitsstranless an einer ebenen platte senkrecht zur strömungsrichtung, *Ind.-Arch.*, 1, pp. 51-59.
- Sheinkman, A.G., Ratnikov, E.F., Scheklein, S.E., 1977, Investigation of heat transfer of liquid film at turbulent flow along a vertical rough surface, in *Nonlinear wave processes in two-phase media* (in Russian), IT SO AN SSSR, Novosibirsk, pp. 222-227.
- Scheklein, S.E., Velkin, V.I., 1988, Heat transfer of liquid with heated surface at periodic flow rate fluctuations (in Russian), *Teplofizika Vysokikh Temperatur*, 2, pp. 406-407.
- Schemagin, I.A., Budov, V.M., Sokolov, V.A., 1983, On waves of interface at vapour condensation (in Russian), *Izv. AN SSSR. Energetika i Transport*, 3, pp. 160-162.
- Shkadov, V.Ya., 1967, Wave regimes of thin layer flow of viscous fluid under the gravity effect (in Russian), *Izv. AN SSSR. Mekh. Zhidk. Gaza*, 1, pp. 43-51.
- Shkadov, V.Ya., 1968, On theory of wave flows of viscous fluid thin layer (in Russian), *Izv. AN SSSR. Mekh. Zhidk. Gaza*, 2, pp. 20-25.
- Shkadov, V.Ya., 1973, *Some methods and problems of the theory of hydrodynamic stability* (in Russian), Institute of Mechanics, 25, Moscow.
- Shkadov, V.Ya., 1977, Solitary waves in a layer of viscous fluid (in Russian), *Izv. AN SSSR. Mekh. Zhidk. Gaza*, 1, pp. 63-66.
- Shkadov, V.Ya., Belikov, V.A., Epikhin, V.E., 1980, Stability of Flows with Interface, *Account, Institute of Mechanics*, MGU, N 2450, 85 p.
- Shkadov, V.Ya., Kholpanov, L.P., Malyusov, V.A., Zhavoronkov, N.M., 1970, On nonlinear theory of wave flows of liquid film (in Russian), *Teor. Osnovy Khim. Tekh.*, 4, 6, pp. 859-867.

- Shuler, P.J., 1974, *Spatial growth of three-dimensional waves on falling film flow*, M.S. Thesis Univ., Colorado, Boulder.
- Shuler, P.J., Krantz, W.B., 1977, Spatially growing three-dimensional waves on falling film flow, *Int. J. Multiphase Flow*, **3**, 6, pp. 609-614.
- Shulman, Z.P., Baikov, V.I., 1979, *Rheodynamics and Heat and Mass Transfer in Film Flows* (in Russian), Minsk, Nauka i tekhnika.
- Sivashinsky, G.I., Michelson, O.M., 1980, On irregular wavy flow of a liquid film down a vertical plane, *Prog. Theor. Phys.*, **63**, pp. 2112-2114.
- Sobin, V.M., 1980, Heat transfer in a falling liquid film at thermal initial region (in Russian), *Inzh.-Fiz. Zhurn.*, **39**, 4, pp. 592-596.
- Sobolik, V., Wein, O., Cermak, J., 1987, Simultaneous measurement of film thickness and wall shear stress in wavy flow of nonnewtonian liquid, *Collection Czechoslovak Chem. Comm.*, **52**, pp. 913-928.
- Sokolov, V.N., Domansky, I.V., 1976, *Gas-Liquid Reactors* (in Russian), Leningrad, Mashinostroenie.
- Squire, H.B., 1933, On the stability for three-dimensional disturbances of viscous flow between parallel walls, *Proc. Roy. Soc.*, A142, pp. 621-628.
- Stainthorp, F.P., Allen, J.M., 1965, The development of ripples on the surface of a liquid film flowing inside a vertical tube, *Trans. Inst. Chem. Engrs.*, **43**, 3, pp. 85-91.
- Strobel, W.J., Whitaker, S., 1969, The effect of surfactants on the flow characteristics of falling liquid films, *AICHE J.*, **15**, 4, pp. 527-532.
- Struve, H., 1969, Wärmeübergang an einem verdampfenden Reiselfilm, *VDI - Forschungsheft*, **534**, p. 36.
- Stücheli, A., Özisik, M.N., 1976, Hydrodynamic entrance lengths of laminar falling films, *Chem. Eng. Sci.*, **31**, 5, pp. 369-372.
- Sutey, A.M., Knudsen, J.G., 1969, Mass transfer at the solid-liquid interface for climbing film flow in an annular duct, *AICHE J.*, **15**, pp. 719-726.
- Tailby, S.R., Portalski, S., 1962, The determination of the wave length on a vertical film of liquid flowing down a hydrodynamically smooth plate, *Trans. Inst. Chem. Engrs.*, **40**, 2, pp. 114-122.
- Takahama, H., Kato, S., 1980, Longitudinal flow characteristics of vertically falling liquid films without concurrent gas flow, *Int. J. Multiphase Flow*, **6**, 3, pp. 203-215.
- Tananaiko, Yu.M., 1968, On investigation into heat transfer at boiling in falling films, *Teplo- i massoperenos* (in Russian), Minsk, Nauka i tekhnika, **2**, pp. 173-179.
- Tananaiko, Yu.M., Vorontsov, E.G., 1975, *Methods of Calculation and Investigation into Film Processes* (in Russian), Kiev, Tekhnika, 312 p.
- Telles, A.S., Dukler, A.E., 1970, Statistical characteristics of thin, vertical, wavy, liquid films, *Ind. Eng. Chem. Fundam.*, **9**, 3, pp. 412-421.

- Tougou, H., 1977, Long waves on a film flow of a viscous fluid down the surface of a vertical cylinder, *J. Phys. Soc. Japan*, **43**, 1, pp. 318-325.
- Trifonov, Yu.Ya., Tsvelodyb, O.Yu., 1985a, Nonlinear waves on the surface of liquid film falling down a vertical wall (in Russian), *Zhurn. Prikl. Mekh. Tekhn. Fiz.*, 5, pp. 15-19.
- Trifonov, Yu.Ya., Tsvelodub, O.Yu., 1985b, Wave regimes in falling liquid films, *Hydrodynamics and heat and mass transfer of liquid flows with a free surface* (in Russian), IT SO AN SSSR, Novosibirsk, pp. 82-102.
- Trifonov, Yu.Ya., Tsvelodub, O.Yu., 1986, Three-dimensional stationary waves on a vertically falling liquid film (in Russian), *Zhurn. Prikl. Mekh. Tekhn. Fiz.*, 6, pp. 35-43.
- Trifonov, Yu.Ya., Tsvelodub, O.Yu., 1988, *On stationary travelling solutions of evolutional equation for perturbations in active dissipative media* (in Russian), Preprint No 188, IT SO AN SSSR, Novosibirsk.
- Tsvelodub, O.Yu., 1980, Solitons on a falling film at moderate liquid flow rates (in Russian), *Zhurn. Prikl. Mekh. Tekhn. Fiz.*, 3, pp. 64-66.
- Tsvelodub, O.Yu., 1989, Nonisothermal absorption in a wavy liquid film (in Russian), *Izv. SO AN SSSR. Ser. Tekh. Nauk*, 1, pp. 44-48.
- Tsvelodub, O.Yu., 1990, *Nonlinear waves on falling films of viscous fluid* (in Russian), Doctorate Thesis, IT SO AN SSSR, Novosibirsk.
- Tsvelodub, O.Yu., Trifonov, Yu.Ya., 1989, On steady-state travelling solutions of an evolution equation describing the behaviour of disturbances in active dissipative media, *Physica. D*, **39**, pp. 336-351.
- Ueda, T., Tanaka, H., 1975, Measurements of velocity, temperature and velocity fluctuation disturbances in falling liquid films, *Int. J. Multiphase Flow*, **2**, 3, pp. 261-272.
- Ünsal, M., 1988, Effect of waves on Nusselt condensation, *Int. J. Heat Mass Transfer*, **31**, 9, pp. 1947-1952.
- Ünsal, M., Thomas, W.C., 1978, Linearized stability analysis of film condensation, *ASME J. Heat Transfer*, **100**, pp. 629-634.
- Ünsal, M., Thomas, W.C., 1980, Nonlinear stability of film condensation, *J. Heat Transfer*, **102**, pp. 483-488.
- Unterberg, W., 1961, *Studies of liquid film flow and evaporation with reference to saline water distillation*, Los Angeles, Univ. of California, Dept. of Engng., Rep. N 61-26.
- Unterberg, W., Edwards, D.K., 1965, Evaporation from falling saline water films on laminar transitional flow, *AIChE J.*, **11**, 6, pp. 1073-1080.
- Voinov, O.V., 1982, Nonlinear capillary waves in thin films of viscous liquid and their destruction (in Russian), *Izv. AN SSSR. Mekh. Zhidk. Gasa*, 4.

- Vorontsov, E.G., Tananaiko, Yu.M., 1972, *Heat Transfer in Liquid Films* (in Russian), Kiev, Tekhnika, 194 p.
- Vyazovov, V.V., 1940, Theory of dilute gas absorption by liquid films (in Russian), *Zhurn. Tekh. Fiz.*, 10, 18, pp. 1519-1532.
- Wasden, F.K., Dukler, A.E., 1989, Numerical investigation of large waves interactions on free falling films, *Int. J. Multiphase Flow*, 15, 3, pp. 357-370.
- Wasden, F.K., Dukler, A.E., 1990, A numerical study of mass transfer in free falling wavy films, *AIChE J.*, 36, 9, pp. 1379-1390.
- Watson, E.J., 1964, The radial spread of a liquid jet over a horizontal plane, *J. Fluid Mech.*, 20, pp. 481-499.
- Webb, D.R., 1970, *Study of the characteristics of downward annular two-phase flow*, A.E.R.E.R6426.
- West, P., Cole, R., 1967, *Chem. Eng. Sci.*, 22, 10, p. 1388.
- Whalley, P.B., McQuillan, K.W., 1985, *The development and use of a directional wall shear stress probe*, Presented at 2nd Int. Conf. on Multiphase Flow, London, Paper G2.
- Whitaker, S., 1964, Effect of surface active agents on the stability of falling liquid films, *Ind. Eng. Chem. Fundam.*, 3, 2, pp. 132-142.
- Whitham, G.B., 1974, *Linear and Nonlinear Waves*, New York, John Wiley & Sons.
- Wilke, W., 1962, *Wärmeübergang an Rieselfilme*. VDI - Forschungsheft 490, 36 p.
- Wilkes, J.O., Nedderman, R.M., 1962, The measurement of velocities in thin films of liquid, *Chem. Eng. Sci.*, 17, pp. 177-187.
- Wragg, A.A., Serafimidis, P., Einarsson, A., 1968, Mass transfer between a falling liquid film and a plane vertical surface, *Int. J. Heat Mass Transfer*, 11, p. 1287.
- Yih, C.S., 1963, Stability of liquid flow down an inclined plane, *Phys. Fluids*, 6, pp. 321-334.
- Yih, C.S., 1967, Instability due to viscosity stratification, *J. Fluid Mech.*, 27, 2, pp. 337-353.
- Zhukauskas, A., Zhiugzhda, I., 1969, *Heat Transfer in Laminar Liquid Flow*, Vilnyus, Mintis. 261 p.