

# Bibliography

- [1] Bernhard Riemann. *Über die Fortpflanzung ebener Luftwellen von endlicher Schwingungsweite*. Dieterich, 1860.
- [2] H Miura. Decay of shock waves in a dusty-gas shock tube. *Fluid Dynamics Research*, 6(5-6):251, 1990.
- [3] Shih-I Pai. *Two-phase flows*, volume 3. Springer-Verlag, 2013.
- [4] Samarpita Bhattacharya and Ujjal Debnath. Thermodynamics of modified chaplygin gas and tachyonic field. *International Journal of Theoretical Physics*, 51(2):565–576, 2012.
- [5] SA Chaplygin. O gazovykh struiakh [on gas jets]. *Moscow-Leningrad: Gosudarstvennoe izdatelstvo tekhniko-teoreticheskoi literatury [in Russian]*, 1949.
- [6] R Courant and KO Friedrichs. Supersonic flow and shock waves, interscience publishers. *Inc., New York*, pages 38–45, 1948.
- [7] A Jeffrey. Quasilinear hyperbolic systems and waves(book). *London, Pitman Publishing, Ltd.(Research Notes in Mathematics,, (5)*, 1976.
- [8] GB Whitham and Richard G Fowler. Linear and nonlinear waves. *Physics Today*, 28:55, 1975.

- [9] Yuxi Zheng. *Systems of Conservation Laws: Two-Dimensional Riemannian Problems*. Springer Science & Business Media, 2001.
- [10] Alberto Bressan. *Hyperbolic systems of conservation laws: the one-dimensional Cauchy problem*, volume 20. Oxford University Press on Demand, 2000.
- [11] Constantine M Dafermos and Constantine M Dafermos. *Hyperbolic conservation laws in continuum physics*, volume 3. Springer, 2005.
- [12] Vishnu D Sharma. *Quasilinear hyperbolic systems, compressible flows, and waves*. CRC Press, 2010.
- [13] Joel Smoller. *Shock waves and reaction—diffusion equations*, volume 258. Springer Science & Business Media, 2012.
- [14] Helge Holden and Nils Henrik Risebro. *Front tracking for hyperbolic conservation laws*, volume 152. Springer, 2015.
- [15] Peter D Lax. *Hyperbolic systems of conservation laws and the mathematical theory of shock waves*. SIAM, 1973.
- [16] Tommaso Ruggeri and Srboljub Simić. On the hyperbolic system of a mixture of eulerian fluids: a comparison between single-and multi-temperature models. *Mathematical methods in the applied sciences*, 30(7):827–849, 2007.
- [17] Tai-Ping Liu. The riemann problem for general systems of conservation laws. *Journal of Differential Equations*, 18(1):218–234, 1975.
- [18] Edwige Godlewski and Pierre-Arnaud Raviart. *Numerical approximation of hyperbolic systems of conservation laws*, volume 118. Springer Science & Business Media, 2013.

- [19] James Glimm. Solutions in the large for nonlinear hyperbolic systems of equations. *Communications on pure and applied mathematics*, 18(4):697–715, 1965.
- [20] Barbara Lee Keyfitz and Herbert C Kranzer. A viscosity approximation to a system of conservation laws with no classical riemann solution. In *Nonlinear hyperbolic problems*, pages 185–197. Springer, 1989.
- [21] Simeon-Denis Poisson. Memoir on the theory of sound. *J. Ecole Polytech. Paris*, 7:319–370, 1808.
- [22] George Gabriel Stokes. Liv. on a difficulty in the theory of sound. *The London, Edinburgh, and Dublin philosophical magazine and journal of science*, 33(223):349–356, 1848.
- [23] Henri Hugoniot. Propagation du mouvement dans les corps. *J. Ec. Polyt. Paris*, 57:1–125, 1889.
- [24] Joel Smoller. Shock waves and reaction-diffusion equations, volume 258 of *Grundlehren der Mathematischen Wissenschaften [Fundamental Principles of Mathematical Sciences]*, 1983.
- [25] JJ Gottlieb and Clinton PT Groth. Assessment of riemann solvers for unsteady one-dimensional inviscid flows of perfect gases. *Journal of Computational Physics*, 78(2):437–458, 1988.
- [26] Eleuterio F Toro. *Riemann solvers and numerical methods for fluid dynamics: a practical introduction*. Springer Science & Business Media, 2013.
- [27] Randall J LeVeque and Randall J Leveque. *Numerical methods for conservation laws*, volume 214. Springer, 1992.
- [28] Alexandre Joel Chorin. Random choice solution of hyperbolic systems. *Journal of computational physics*, 22(4):517–533, 1976.

- [29] Alexandre Joel Chorin. Numerical solution of the navier-stokes equations. *Mathematics of computation*, 22(104):745–762, 1968.
- [30] Bram Van Leer. Towards the ultimate conservative difference scheme. v. a second-order sequel to godunov’s method. *Journal of computational Physics*, 32(1):101–136, 1979.
- [31] Randall J LeVeque et al. *Finite volume methods for hyperbolic problems*, volume 31. Cambridge university press, 2002.
- [32] Richard Courant and Kurt Otto Friedrichs. *Supersonic flow and shock waves*, volume 21. Springer Science & Business Media, 1999.
- [33] Hongjun Cheng. Riemann problem for one-dimensional system of conservation laws of mass, momentum and energy in zero-pressure gas dynamics. *Differential Equations & Applications*, 4(4):653–664, 2012.
- [34] Gui-Qiang Chen and Hailiang Liu. Formation of  $\delta$ -shocks and vacuum states in the vanishing pressure limit of solutions to the euler equations for isentropic fluids. *SIAM journal on mathematical analysis*, 34(4):925–938, 2003.
- [35] KT Joseph. A riemann problem whose viscosity solutions contain  $\delta$ -measures. *Asymptotic Analysis*, 7(2):105–120, 1993.
- [36] Tai-Ping Liu and Zhouping Xin. Stability of viscous shock waves associated with a system of nonstrictly hyperbolic conservations laws. *Communications on pure and applied mathematics*, 45(4):361–388, 1992.
- [37] Yating Song and Lihui Guo. General limiting behavior of riemann solutions to the non-isentropic euler equations for modified chaplygin gas. *Journal of Mathematical Physics*, 61(4):041506, 2020.

- [38] Meina Sun. Concentration and cavitation phenomena of riemann solutions for the isentropic euler system with the logarithmic equation of state. *Nonlinear Analysis: Real World Applications*, 53:103068, 2020.
- [39] Hanchun Yang and Jinjing Liu. Concentration and cavitation in the euler equations for nonisentropic fluids with the flux approximation. *Nonlinear Analysis: Theory, Methods & Applications*, 123:158–177, 2015.
- [40] Yunfeng Zhang and Meina Sun. Concentration phenomenon of riemann solutions for the relativistic euler equations with the extended chaplygin gas. *Acta Applicandae Mathematicae*, pages 1–30, 2020.
- [41] Gui-Qiang Chen and Hailiang Liu. Concentration and cavitation in the vanishing pressure limit of solutions to the euler equations for nonisentropic fluids. *Physica D: Nonlinear Phenomena*, 189(1-2):141–165, 2004.
- [42] Gan Yin and Wancheng Sheng. Delta wave formation and vacuum state in vanishing pressure limit for system of conservation laws to relativistic fluid dynamics. *ZAMM-Journal of Applied Mathematics and Mechanics/Zeitschrift für Angewandte Mathematik und Mechanik*, 95(1):49–65, 2015.
- [43] Meina Sun. The multiplication of distributions in the study of delta shock wave for the nonlinear chromatography system. *Applied Mathematics Letters*, 96:61–68, 2019.
- [44] Chun Shen and Meina Sun. Formation of delta shocks and vacuum states in the vanishing pressure limit of riemann solutions to the perturbed aw–rascle model. *Journal of Differential Equations*, 249(12):3024–3051, 2010.
- [45] Hanchun Yang and Jinhuan Wang. Delta-shocks and vacuum states in the vanishing pressure limit of solutions to the isentropic euler equations for modified

- chaplygin gas. *Journal of Mathematical Analysis and Applications*, 413(2):800–820, 2014.
- [46] Hanchun Yang and Jinhuan Wang. Concentration in vanishing pressure limit of solutions to the modified chaplygin gas equations. *Journal of Mathematical Physics*, 57(11):111504, 2016.
- [47] Jinjing Liu and Wanyi Xiao. Flux approximation to the aw-rascle model of traffic flow. *Journal of Mathematical Physics*, 59(10):101508, 2018.
- [48] Meina Sun. The limits of riemann solutions to the simplified pressureless euler system with flux approximation. *Mathematical Methods in the Applied Sciences*, 41(12):4528–4548, 2018.
- [49] Yunfeng Zhang and Meina Sun. The intrinsic phenomena of concentration and cavitation on the riemann solutions for the perturbed macroscopic production model. *Mathematical Methods in the Applied Sciences*, 45(2):864–881, 2022.
- [50] De Chun Tan and Tong Zhang. Two-dimensional riemann problem for a hyperbolic system of nonlinear conservation laws: I. four-j cases. *Journal of Differential Equations*, 111(2):203–254, 1994.
- [51] De Chun Tan, Tong Zhang, Tung Chang, and YX Zheng. Delta-shock waves as limits of vanishing viscosity for hyperbolic systems of conservation laws. *Journal of Differential Equations*, 112(1):1–32, 1994.
- [52] Jiequan Li and Hanchun Yang. Delta-shocks as limits of vanishing viscosity for multidimensional zero-pressure gas dynamics. *Quarterly of Applied mathematics*, 59(2):315–342, 2001.
- [53] Tong Zhang and Yuxi Zheng. *Conjecture on Structure of Solutions of Riemann Problem for 2-D Gasdynamic System*. 1989.

- [54] Yuxi Zheng and TH Moulden. Systems of conservation laws: Two-dimensional riemann problems. *progress in nonlinear differential equations and their applications*, vol. 38. *Appl. Mech. Rev.*, 55(5):B97–B97, 2002.
- [55] James Glimm, Xiaomei Ji, Jiequan Li, Xiaolin Li, Peng Zhang, Tong Zhang, and Yuxi Zheng. Transonic shock formation in a rarefaction riemann problem for the 2d compressible euler equations. *SIAM Journal on Applied Mathematics*, 69(3):720–742, 2008.
- [56] Shuxing Chen and Aifang Qu. Two-dimensional riemann problems for chaplygin gas. *SIAM Journal on Mathematical Analysis*, 44(3):2146–2178, 2012.
- [57] C Curro, D Fusco, and N Manganaro. A reduction procedure for generalized riemann problems with application to nonlinear transmission lines. *Journal of Physics A: Mathematical and Theoretical*, 44(33):335205, 2011.
- [58] Carmela Curró and Natale Manganaro. Generalized riemann problems and exact solutions for p-systems with relaxation. *Ricerche di Matematica*, 65(2):549–562, 2016.
- [59] C Curro, D Fusco, and N Manganaro. Differential constraints and exact solution to riemann problems for a traffic flow model. *Acta applicandae mathematicae*, 122(1):167–178, 2012.
- [60] C Curro and N Manganaro. Riemann problems and exact solutions to a traffic flow model. *Journal of Mathematical Physics*, 54(7):071503, 2013.
- [61] NN Janenko. Compatibility theory and methods of integration of systems of nonlinear partial differential equation. *Proc. of the Fourth All-Union Math. Cong. (Leningrad)*, pages 247–252, 1964.

- [62] C Currò and D Fusco. On a class of quasilinear hyperbolic reducible systems allowing for special wave interactions. *Zeitschrift für angewandte Mathematik und Physik ZAMP*, 38(4):580–594, 1987.
- [63] C Curró, D Fusco, and N Manganaro. Hodograph transformation and differential constraints for wave solutions to  $2 \times 2$  quasilinear hyperbolic non-homogeneous systems. *Journal of Physics A: Mathematical and Theoretical*, 45(19):195207, 2012.
- [64] C Curró, D Fusco, and N Manganaro. Exact description of simple wave interactions in multicomponent chromatography. *Journal of Physics A: Mathematical and Theoretical*, 48(1):015201, 2014.
- [65] C Curró, N Manganaro, and MV Pavlov. Nonlinear wave interaction problems in three dimensional case. *arXiv preprint arXiv:1612.00162*, 2016.
- [66] Carmela Curró and Natale Manganaro. Differential constraints and exact solutions for the et6 model. *Ricerche di Matematica*, pages 1–15, 2018.
- [67] Sueet Millon Sahoo, T Raja Sekhar, and GP Raja Sekhar. Exact solutions of generalized riemann problem for rate-type material. *International Journal of Non-Linear Mechanics*, 110:16–20, 2019.
- [68] Ming Mei. Best asymptotic profile for hyperbolic p-system with damping. *SIAM Journal on Mathematical Analysis*, 42(1):1–23, 2010.
- [69] Kenji Nishihara and Tong Yang. Boundary effect on asymptotic behaviour of solutions to the p-system with linear damping. *journal of differential equations*, 156(2):439–458, 1999.
- [70] Tao Luo, Roberto Natalini, and Tong Yang. Global bv solutions to a p-system with relaxation. *Journal of Differential Equations*, 162(1):174–198, 2000.

- [71] Tong Yang and Changjiang Zhu. Existence and non-existence of global smooth solutions for p-system with relaxation. *Journal of Differential Equations*, 161(2):321–336, 2000.
- [72] Ming Mei. Nonlinear diffusion waves for hyperbolic p-system with nonlinear damping. *Journal of Differential Equations*, 247(4):1275–1296, 2009.
- [73] B. Seymour and E. Varley. Exact solutions describing soliton-like interactions in a nondispersive medium. *SIAM Journal on Applied Mathematics*, 42(4):804–821, 1982.
- [74] Natale Manganaro. Riemann problems for viscoelastic media. *Rendiconti Lincei-Matematica e Applicazioni*, 28(3):479–495, 2017.
- [75] A Chaiyasena, W Worapitpong, and SV Meleshko. Generalized riemann waves and their adjointment through a shock wave. *Mathematical Modelling of Natural Phenomena*, 13(2):22, 2018.
- [76] T Raja Sekhar and VD Sharma. Riemann problem and elementary wave interactions in isentropic magnetogasdynamics. *Nonlinear Analysis: Real World Applications*, 11(2):619–636, 2010.
- [77] R Singh and LP Singh. Solution of the riemann problem in magnetogasdynamics. *International Journal of Non-Linear Mechanics*, 67:326–330, 2014.
- [78] Sahadeb Kuila and T Raja Sekhar. Riemann solution for one dimensional non-ideal isentropic magnetogasdynamics. *Computational and Applied Mathematics*, 35(1):119–133, 2016.
- [79] Pooja Gupta, LP Singh, and R Singh. Riemann problem for non-ideal polytropic magnetogasdynamic flow. *International Journal of Non-Linear Mechanics*, 2019.

- [80] Oleg V Kaptsov and Igor V Verevkin. Differential constraints and exact solutions of nonlinear diffusion equations. *Journal of Physics A: Mathematical and General*, 36(5):1401, 2003.
- [81] Carmela Curró and Natale Manganaro. Differential constraints and exact solutions for the et6 model. *Ricerche di Matematica*, 68(1):179–193, 2019.
- [82] MP Edwards and P Broadbridge. Exact transient solutions to nonlinear diffusion-convection equations in higher dimensions. *Journal of Physics A: Mathematical and General*, 27(16):5455, 1994.
- [83] Pierre-Henri Chavanis and Clément Sire. Logotropic distributions. *Physica A: Statistical Mechanics and its Applications*, 375(1):140–158, 2007.
- [84] Pierre-Henri Chavanis. The logotropic dark fluid as a unification of dark matter and dark energy. *Physics Letters B*, 758:59–66, 2016.
- [85] Sergei D Odintsov, VK Oikonomou, AV Timoshkin, Emmanuel N Saridakis, and R Myrzakulov. Cosmological fluids with logarithmic equation of state. *Annals of Physics*, 398:238–253, 2018.
- [86] Th von Karman. Compressibility effects in aerodynamics. *Journal of the Aeronautical Sciences*, 8(9):337–356, 1941.
- [87] Hsue-Shen Tsien. Two-dimensional subsonic flow of compressible fluids. *Journal of the Aeronautical Sciences*, 6(10):399–407, 1939.
- [88] Y Brenier. Solutions with concentration to the riemann problem for the one-dimensional chaplygin gas equations. *Journal of Mathematical Fluid Mechanics*, 7(3):S326–S331, 2005.

- [89] Rahul Kumar Chaturvedi, Pooja Gupta, and LP Singh. Solution of generalized riemann problem for hyperbolic p- system with damping. *International Journal of Non-Linear Mechanics*, 2019.
- [90] Chun Shen. The riemann problem for the chaplygin gas equations with a source term. *ZAMM-Journal of Applied Mathematics and Mechanics/Zeitschrift für Angewandte Mathematik und Mechanik*, 96(6):681–695, 2016.
- [91] Meina Sun. The exact riemann solutions to the generalized chaplygin gas equations with friction. *Communications in Nonlinear Science and Numerical Simulation*, 36:342–353, 2016.
- [92] V Danilov and V Shelkovich. Delta-shock wave type solution of hyperbolic systems of conservation laws. *Quarterly of Applied Mathematics*, 63(3):401–427, 2005.
- [93] RK Gupta, Triloki Nath, and LP Singh. Solution of riemann problem for dusty gas flow. *International Journal of Non-Linear Mechanics*, 82:83–92, 2016.
- [94] JP Chaudhary and LP Singh. Riemann problem and elementary wave interactions in dusty gas. *Applied Mathematics and Computation*, 342:147–165, 2019.
- [95] Stuart B Savage and K Hutter. The motion of a finite mass of granular material down a rough incline. *Journal of fluid mechanics*, 199:177–215, 1989.
- [96] Gloria Faccanoni and Anne Mangeney. Exact solution for granular flows. *International Journal for Numerical and Analytical Methods in Geomechanics*, 37(10):1408–1433, 2013.
- [97] HB Benaoum. Accelerated universe from modified chaplygin gas and tachyonic fluid. *arXiv preprint hep-th/0205140*, 2002.

- [98] Hachemi B Benaoum. Modified chaplygin gas cosmology. *Advances in High Energy Physics*, 2012, 2012.
- [99] Surajit Chattopadhyay and Ujjal Debnath. Interaction between phantom field and modified chaplygin gas. *Astrophysics and Space Science*, 326(2):155–158, 2010.
- [100] Ujjal Debnath. Constraining the parameters of modified chaplygin gas in einstein-aether gravity. *Advances in High Energy Physics*, 2014, 2014.
- [101] Prabir Rudra, Chayan Ranjit, and Sujata Kundu. How effective is new variable modified chaplygin gas to play the role of dark energy—a dynamical system analysis in rs ii brane model. *Astrophysics and Space Science*, 347(2):433–444, 2013.
- [102] Rahul Kumar Chaturvedi and LP Singh. Riemann solutions to the logotropic system with a coulomb-type friction. *Ricerche di Matematica*, pages 1–14, 2020.
- [103] Guodong Wang. The riemann problem for one dimensional generalized chaplygin gas dynamics. *Journal of Mathematical Analysis and Applications*, 403(2):434–450, 2013.
- [104] MC Bento, Orfeu Bertolami, and Anjan A Sen. Generalized chaplygin gas, accelerated expansion, and dark-energy-matter unification. *Physical Review D*, 66(4):043507, 2002.
- [105] Maria C Bento, O Bertolami, and AA Sen. Generalized chaplygin gas model: dark energy—dark matter unification and cmbr constraints. *General Relativity and Gravitation*, 35(11):2063–2069, 2003.

- [106] D Zeidan. The riemann problem for a hyperbolic model of two-phase flow in conservative form. *International Journal of Computational Fluid Dynamics*, 25(6):299–318, 2011.
- [107] E Romenski, D Zeidan, A Slaouti, and EF Toro. Hyperbolic conservative model for compressible two-phase flow. *Reprint of the Isaac Newton Institute for Mathematical Sciences, NI03022-NPA, Cambridge, UK*, pages 1–13, 2003.
- [108] D Zeidan, P Bähr, P Farber, J Gräbel, and P Ueberholz. Numerical investigation of a mixture two-phase flow model in two-dimensional space. *Computers & Fluids*, 181:90–106, 2019.
- [109] D Zeidan, LT Zhang, and E Goncalves. High-resolution simulations for aerogel using two-phase flow equations and godunov methods. *International Journal of Applied Mechanics*, 2020.
- [110] D Zeidan, E Romenski, Arezki Slaouti, and EF Toro. Numerical study of wave propagation in compressible two-phase flow. *International journal for numerical methods in fluids*, 54(4):393–417, 2007.
- [111] DJ Korchinski. Solution of a riemann problem for a  $2 \times 2$  system of conservation laws possessing no classical weak solution [ph. d. thesis]. *Adelphi University*, 1977.
- [112] Rahul Kumar Chaturvedi, Pooja Gupta, and LP Singh. Evolution of weak shock wave in two-dimensional steady supersonic flow in dusty gas. *Acta Astronautica*, 160:552–557, 2019.
- [113] T Elperin, G Ben-Dor, and O Igra. Head-on collision of normal shock waves in dusty gases. *International journal of heat and fluid flow*, 8(4):303–312, 1987.

- [114] Walter Gretler and Rene Regenfelder. Similarity solution for variable energy shock waves in a dusty gas under isothermal flow-field condition. *Fluid dynamics research*, 32(3):69, 2003.
- [115] Fumio Higashino and Tateyuki Suzuki. The effect of particles on blast waves in a dusty gas. *Zeitschrift für Naturforschung A*, 35(12):1330–1336, 1980.
- [116] H Miura and Irvine Israel Glass. On the passage of a shock wave through a dusty-gas layer. *Proceedings of the Royal Society of London. A. Mathematical and Physical Sciences*, 385(1788):85–105, 1983.
- [117] SI Pai, S Menon, and ZQ Fan. Similarity solutions of a strong shock wave propagation in a mixture of a gas and dusty particles. *International Journal of Engineering Science*, 18(12):1365–1373, 1980.
- [118] Helfried Steiner and Thomas Hirschler. A self-similar solution of a shock propagation in a dusty gas. *European Journal of Mechanics-B/Fluids*, 21(3):371–380, 2002.
- [119] Yu G Rykov, Ya G Sinai, et al. Generalized variational principles, global weak solutions and behavior with random initial data for systems of conservation laws arising in adhesion particle dynamics. *Communications in mathematical physics*, 177(2):349–380, 1996.
- [120] Yann Brenier and Emmanuel Grenier. Sticky particles and scalar conservation laws. *SIAM journal on numerical analysis*, 35(6):2317–2328, 1998.
- [121] Sergei F Shandarin and Ya B Zeldovich. The large-scale structure of the universe: Turbulence, intermittency, structures in a self-gravitating medium. *Reviews of Modern Physics*, 61(2):185, 1989.

- [122] Rahul Kumar Chaturvedi, LP Singh, and Dia Zeidan. Delta shock wave solution of the riemann problem for the non-homogeneous modified chaplygin gasdynamics. *Journal of Dynamics and Differential Equations*, pages 1–18, 2020.
- [123] Pooja Gupta, Rahul Kumar Chaturvedi, and LP Singh. The generalized riemann problem for the chaplygin gas equation. *European Journal of Mechanics-B/Fluids*, 2020.
- [124] Triloki Nath, RK Gupta, and LP Singh. Solution of riemann problem for ideal polytropic dusty gas. *Chaos, Solitons & Fractals*, 95:102–110, 2017.
- [125] Yicheng Pang, Jianjun Ge, Huawei Yang, and Min Hu. The riemann problem for an isentropic ideal dusty gas flow with a magnetic field. *Mathematical Methods in the Applied Sciences*, 43(7):4036–4049, 2020.
- [126] Chun Shen. The limits of riemann solutions to the isentropic magnetogasdynamics. *Applied Mathematics Letters*, 24(7):1124–1129, 2011.
- [127] JP Vishwakarma and G Nath. Similarity solutions for unsteady flow behind an exponential shock in a dusty gas. *Physica Scripta*, 74(4):493, 2006.
- [128] Meera Chadha and J Jena. Propagation of weak waves in a dusty, van der waals gas. *Meccanica*, 51(9):2145–2157, 2016.
- [129] Gorakh Nath. Shock wave driven out by a piston in a mixture of a non-ideal gas and small solid particles under the influence of the gravitation field with monochromatic radiation. *Chinese Journal of Physics*, 56(6):2741–2752, 2018.
- [130] Rahul Kumar Chaturvedi, Shobhit Kumar Srivastava, and LP Singh. Effect of solid dust particles on the propagation of shock wave in planar and non-planar gasdynamics. *Chinese Journal of Physics*, 2020.

- [131] Shobhit Kumar Srivastava, Rahul Kumar Chaturvedi, and Lal Pratap Singh. On the evolution of acceleration discontinuities in van der waals dusty magnetogasdynamics. *Zeitschrift für Naturforschung A*, 76(5):435–443, 2021.
- [132] Sonu Mehla and J Jena. Shock wave kinematics in a relaxing gas with dust particles. *Zeitschrift für Naturforschung A*, 74(9):787–798, 2019.
- [133] Rishi Ram. Effect of radiative heat transfer on the growth and decay of acceleration waves. *Applied Scientific Research*, 34(1):93–104, 1978.
- [134] Rama Shankar. On growth and propagation of shock waves in radiation-magneto gas dynamics. *International journal of engineering science*, 27(11):1315–1323, 1989.
- [135] Joseph B Keller. Geometrical acoustics. i. the theory of weak shock waves. *Journal of Applied Physics*, 25(8):938–947, 1954.
- [136] Rahul Kumar Chaturvedi, Shobhit Kumar Srivastava, and LP Singh. Evolution of acceleration waves in non-ideal radiative magnetogasdynamics. *The European Physical Journal Plus*, 134(11):564, 2019.
- [137] Zhen-Huan Teng, Alexandre Joel Chorin, and Tai Ping Liu. Riemann problems for reacting gas, with applications to transition. *SIAM Journal on Applied Mathematics*, 42(5):964–981, 1982.
- [138] Mariano Torrisi. Conservation laws and growth of discontinuities in a reactive polytropic gas. *Zeitschrift für angewandte Mathematik und Physik ZAMP*, 38(1):117–128, 1987.
- [139] M Torrisi. Similarity solution and wave propagation in a reactive polytropic gas. *Journal of engineering mathematics*, 22(3):239–251, 1988.

- [140] M Groppi, K Aoki, G Spiga, and V Tritsch. Shock structure analysis in chemically reacting gas mixtures by a relaxation-time kinetic model. *Physics of Fluids*, 20(11):117103, 2008.
- [141] GI Barenblatt, AJ Chorin, and A Kast. The influence of the flow of the reacting gas on the conditions for a thermal explosion. *Proceedings of the National Academy of Sciences*, 94(24):12762–12764, 1997.
- [142] Christophe Harlé, Graham F Carey, and Philip L Varghese. Analysis of high speed non-equilibrium chemically reacting gas flows. part ii. a finite volume/finite element model and numerical studies. *International journal for numerical methods in fluids*, 32(6):691–709, 2000.
- [143] John David Logan and John B Bdzhil. Self-similar solution of the spherical detonation problem. *Combustion and Flame*, 46:253–269, 1982.
- [144] Lung An Ying and Ching Hua Wang. The discontinuous initial value problem of a reacting gas flow. *Transactions of the American Mathematical Society*, 266(2):361–387, 1981.
- [145] AE Medvedev. Reflection of an oblique shock wave in a reacting gas with a finite relaxation-zone length. *Journal of Applied Mechanics and Technical Physics*, 42(2):211–218, 2001.
- [146] Randheer Singh and Jasobanta Jena. Interaction of an acceleration wave with a strong shock in reacting polytropic gases. *Applied Mathematics and Computation*, 225:638–644, 2013.
- [147] Randheer Singh and J Jena. On evolution of non-linear waves in polytropic reacting gases. *Journal of Mathematical Chemistry*, 56(1):232–246, 2018.

- [148] Sarswati Shah and Randheer Singh. Collision of a steepened wave with a blast wave in dusty real reacting gases. *Physics of Fluids*, 31(7):076103, 2019.
- [149] To Nagy. Evolution of weak discontinuities in a radiating magnetofluid. *Acta mechanica*, 101(1):175–197, 1993.

# List of Publications (SCI/SCIE)

1. **Rahul Kumar Chaturvedi**, L.P. Singh, The Phenomena of Concentration and Cavitation in the Riemann Solution for the Isentropic Zero-pressure Dusty Gasdynamics, *Journal of Mathematical Physics* 62 (2021). (American Institute of Physics, USA)  
DOI: <https://doi.org/10.1063/5.0023511>
2. **Rahul Kumar Chaturvedi**, Pooja Gupta and L.P. Singh, “Solution of generalized Riemann problem for hyperbolic p- system with damping,” *International Journal of Non-Linear Mechanics*, vol. 117, pp. 103–229, 2019. (Elsevier)  
DOI: <https://doi.org/10.1016/j.ijnonlinmec.2019.07.014>
3. **Rahul Kumar Chaturvedi**, L.P. Singh and D Zeidan, Delta Shock Wave Solution of the Riemann Problem for the Non-homogeneous Modified Chaplygin Gasdynamics. *Journal of Dynamics and Differential Equations*, 1-18, 33 (2020). (Springer)  
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4. **Rahul Kumar Chaturvedi**, L.P. Singh The propagation of shock wave in planar and non-planar polytropic reacting gas with dust particles. *Zeitschrift*

*für Angewandte Mathematik und Mechanik* (ZAMM), (Under revision)  
(Wiley)

5. **Rahul Kumar Chaturvedi**, L.P. Singh. Riemann solutions to the logotropic system with a Coulomb-type friction. *Ricerche di matematica*, 1–14 (2020). (Springer)

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6. **Rahul Kumar Chaturvedi**, Pooja Gupta and L.P. Singh, “Evolution of weak shock wave in two-dimensional steady supersonic flow in dusty gas,” *Acta Astronautica*, vol. 160, pp. 552–557, 2019. (Elsevier)

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7. Pooja Gupta, **Rahul Kumar Chaturvedi**\*, L.P. Singh, The generalized Riemann problem for the Chaplygin gas equation, *European Journal of Mechanics - B/Fluids*, 82(2020) 61-65. (Elsevier)

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8. **Rahul Kumar Chaturvedi**, Shobhit Kumar Srivastava, L.P. Singh, Evolution of acceleration waves in non-ideal radiative magnetogasdynamics, *Eur. Phys. J. Plus* 134(2019): 564-574. (Springer)

**DOI:** <https://doi.org/10.1140/epjp/i2019-12895-3>

9. **Rahul Kumar Chaturvedi**, Shobhit Kumar Srivastava, L.P. Singh, Effect of solid dust particles on the propagation of shock wave in planar and non-planar gasdynamics, *Chinese Journal of Physics*, 65 (2020): 114-122. (Elsevier)

**DOI:** <https://doi.org/10.1016/j.cjph.2020.02.024>

10. **Rahul Kumar Chaturvedi**, Pooja Gupta, S.K. Srivastava and L.P. Singh, “Evolution of  $C^1$  wave and its collision with the blast wave in one-dimensional non-ideal gas dynamics,” *Computational and Applied Mathematics*, vol.39, no.3,

- pp. 1–13, 2020. (Springer)  
DOI: <https://doi.org/10.1007/s40314-020-01294-5>
11. Shobhit Kumar Srivastava, **Rahul Kumar Chaturvedi** and L. P. Singh, On the evolution of finite and small amplitude waves in non-ideal gas with dust particles, *Physica Scripta*, 95 (6), 065205 (2020). (IOP)  
DOI: <https://doi.org/10.1088/1402-4896/ab7fec>
12. Shobhit Kumar Srivastava, **Rahul Kumar Chaturvedi** and L. P. Singh, On the evolution of acceleration discontinuities in van der Waals dusty magnetogasdynamics, *Zeitschrift für Naturforschung A* 76 (2021). (De Gruyter)  
DOI: <https://doi.org/10.1515/zna-2020-0351>
13. Pooja Gupta, **Rahul Kumar Chaturvedi**, and L.P. Singh, “The propagation of weak shock waves in non-ideal gas flow with radiation,” *The European Physical Journal Plus* , vol. 135, no.1, pp. 1–15, 2020. (Springer)  
DOI: <https://doi.org/10.1140/epjp/s13360-019-00041-y>
14. Pooja Gupta, **Rahul Kumar Chaturvedi**, and L.P. Singh, “Interaction of waves in one-dimensional dusty gas flow,” *Zeitschrift fr Naturforschung A (ZNA)*, vol. 76, no.3, pp. 201–208, 2021. (De Gruyter)  
DOI: <https://doi.org/10.1515/zna-2020-0061>
15. **Rahul Kumar Chaturvedi**, Pradeep and L.P. Singh, ”The formation of shock wave in a two-dimensional supersonic planar and axisymmetric non-ideal gas flow with magnetic field,” *Computational and Applied Mathematics*, vol. 40, no.8, pp. 1–14, 2021. (Springer)  
DOI: <https://doi.org/10.1007/s40314-021-01672-7>

16. Pooja Gupta, **Rahul Kumar Chaturvedi**, and L.P. Singh, "Solution of Riemann Problem of Conservation laws in van der Waals Gas," *Waves in Random and Complex Media*, pp. 1–19, 2022. (Taylor & Francis)

DOI: <https://doi.org/10.1080/17455030.2021.2017068>

17. Pradeep, **Rahul Kumar Chaturvedi** and L.P. Singh, "The effect of dust particles on the evolution of planar and non-planar shock wave in two-dimensional supersonic flow of van der Waals gas," *The European Physical Journal Plus*, vol. 137, no.2, pp. 1–12, 2022. (Springer)

DOI: <https://doi.org/10.1140/epjp/s13360-022-02437-9>