Boris S Kerner

List of Publications by Year
in descending order

126 papers	7,103 citations	71102 41 h-index	88630 70 g-index
134 all docs	134 docs citations	134 times ranked	1706 citing authors

#	Article	IF	Citations
1	Cluster effect in initially homogeneous traffic flow. Physical Review E, 1993, 48, R2335-R2338.	2.1	598
2	The Physics of Traffic. Understanding Complex Systems, 2004, , .	0.6	520
3	Structure and parameters of clusters in traffic flow. Physical Review E, 1994, 50, 54-83.	2.1	453
4	Cellular automata approach to three-phase traffic theory. Journal of Physics A, 2002, 35, 9971-10013.	1.6	383
5	Introduction to Modern Traffic Flow Theory and Control. , 2009, , .		359
6	The physics of traffic. Physics World, 1999, 12, 25-30.	0.0	314
7	Empirical macroscopic features of spatial-temporal traffic patterns at highway bottlenecks. Physical Review E, 2002, 65, 046138.	2.1	251
8	Three-phase traffic theory and highway capacity. Physica A: Statistical Mechanics and Its Applications, 2004, 333, 379-440.	2.6	241
9	A microscopic model for phase transitions in traffic flow. Journal of Physics A, 2002, 35, L31-L43.	1.6	225
10	Local cluster effect in different traffic flow models. Physica A: Statistical Mechanics and Its Applications, 1998, 255, 163-188.	2.6	185
11	Microscopic theory of spatial-temporal congested traffic patterns at highway bottlenecks. Physical Review E, 2003, 68, 036130.	2.1	179
12	Congested Traffic Flow: Observations and Theory. Transportation Research Record, 1999, 1678, 160-167.	1.9	170
13	Deterministic spontaneous appearance of traffic jams in slightly inhomogeneous traffic flow. Physical Review E, 1995, 51, 6243-6246.	2.1	141
14	Criticism of generally accepted fundamentals and methodologies of traffic and transportation theory: A brief review. Physica A: Statistical Mechanics and Its Applications, 2013, 392, 5261-5282.	2.6	134
15	Deterministic microscopic three-phase traffic flow models. Journal of Physics A, 2006, 39, 1775-1809.	1.6	125
16	Complexity of Synchronized Flow and Related Problems for Basic Assumptions of Traffic Flow Theories. Networks and Spatial Economics, 2001, 1, 35-76.	1.6	124
17	Autosolitons. Uspekhi Fizicheskikh Nauk, 1989, 32, 101-138.	0.3	122
18	Failure of classical traffic flow theories: Stochastic highway capacity and automatic driving. Physica A: Statistical Mechanics and Its Applications, 2016, 450, 700-747.	2.6	116

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19	Experimental features of the emergence of moving jams in free traffic flow. Journal of Physics A, 2000, 33, L221-L228.	1.6	108
20	Recognition and tracking of spatialâ€“temporal congested traffic patterns on freeways. Transportation Research Part C: Emerging Technologies, 2004, 12, 369-400.	7.6	106
21	Phase transitions in traffic flow on multilane roads. Physical Review E, 2009, 80, 056101.	2.1	98
22	Self-organization in active distributed media: scenarios for the spontaneous formation and evolution of dissipative structures. Uspekhi Fizicheskikh Nauk, 1990, 33, 679-719.	0.3	88
23	Theory of Breakdown Phenomenon at Highway Bottlenecks. Transportation Research Record, 2000, 1710, 136-144.	1.9	87
24	Effect of driver over-acceleration on traffic breakdown in three-phase cellular automaton traffic flow models. Physica A: Statistical Mechanics and Its Applications, 2013, 392, 4083-4105.	2.6	84
25	Simple cellular automaton model for traffic breakdown, highway capacity, and synchronized flow. Physical Review E, 2011, 84, 046110.	2.1	81
26	Traffic dynamics in empirical probe vehicle data studied with three-phase theory: Spatiotemporal reconstruction of traffic phases and generation of jam warning messages. Physica A: Statistical Mechanics and Its Applications, 2013, 392, 221-251.	2.6	78
27	Spatialâ€“temporal patterns in heterogeneous traffic flow with a variety of driver behavioural characteristics and vehicle parameters. Journal of Physics A, 2004, 37, 8753-8788.	1.6	75
28	Microscopic features of moving traffic jams. Physical Review E, 2006, 73, 046107.	2.1	73
29	Spontaneous appearance of rocking localized current filaments in a nonequilibrium distributive system. Physical Review B, 1992, 46, 7559-7570.	3.2	71
30	Three-phase theory of city traffic: Moving synchronized flow patterns in under-saturated city traffic at signals. Physica A: Statistical Mechanics and Its Applications, 2014, 397, 76-110.	2.6	70
31	Breakdown in Traffic Networks. , 2017, , .		67
32	Control of spatiotemporal congested traffic patterns at highway bottlenecks. Physica A: Statistical Mechanics and Its Applications, 2005, 355, 565-601.	2.6	65
33	Aerial observations of moving synchronized flow patterns in over-saturated city traffic. Transportation Research Part C: Emerging Technologies, 2018, 86, 393-406.	7.6	60
34	Complexity of spatiotemporal traffic phenomena in flow of identical drivers: Explanation based on fundamental hypothesis of three-phase theory. Physical Review E, 2012, 85, 036110.	2.1	56
35	A theory of traffic congestion at heavy bottlenecks. Journal of Physics A: Mathematical and Theoretical, 2008, 41, 215101.	2.1	53
36	A theory of traffic congestion at moving bottlenecks. Journal of Physics A: Mathematical and Theoretical, 2010, 43, 425101.	2.1	53

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37	The physics of green-wave breakdown in a city. Europhysics Letters, 2013, 102, 28010.	2.0	51
38	Criterion for traffic phases in single vehicle data and empirical test of a microscopic three-phase traffic theory. Journal of Physics A, 2006, 39, 2001-2020.	1.6	49
39	Empirical test of a microscopic three-phase traffic theory. Nonlinear Dynamics, 2007, 49, 525-553.	5.2	49
40	Failure of classical traffic flow theories: a critical review. Elektrotechnik Und Informationstechnik, 2015, 132, 417-433.	1.1	49
41	Microscopic theory of traffic-flow instability governing traffic breakdown at highway bottlenecks: Growing wave of increase in speed in synchronized flow. Physical Review E, 2015, 92, 062827.	2.1	46
42	Optimum principle for a vehicular traffic network: minimum probability of congestion. Journal of Physics A: Mathematical and Theoretical, 2011, 44, 092001.	2.1	45
43	Probabilistic physical characteristics of phase transitions at highway bottlenecks: Incommensurability of three-phase and two-phase traffic-flow theories. Physical Review E, 2014, 89, 052807.	2.1	45
44	Empirical Features of Congested Patterns at Highway Bottlenecks. Transportation Research Record, 2002, 1802, 145-154.	1.9	43
45	Physics of traffic gridlock in a city. Physical Review E, 2011, 84, 045102.	2.1	42
46	Control of Spatiotemporal Congested Traffic Patterns at Highway Bottlenecks. IEEE Transactions on Intelligent Transportation Systems, 2007, 8, 308-320.	8.0	38
47	Physics of automated driving in framework of three-phase traffic theory. Physical Review E, 2018, 97, 042303.	2.1	38
48	Breakdown minimization principle versus Wardropâ€™s equilibria for dynamic traffic assignment and control in traffic and transportation networks: A critical mini-review. Physica A: Statistical Mechanics and Its Applications, 2017, 466, 626-662.	2.6	37
49	The physics of empirical nuclei for spontaneous traffic breakdown in free flow at highway bottlenecks. Physica A: Statistical Mechanics and Its Applications, 2015, 438, 365-397.	2.6	36
50	Empirical synchronized flow in oversaturated city traffic. Physical Review E, 2014, 90, 032810.	2.1	32
51	Study of Freeway Speed Limit Control Based on Three-Phase Traffic Theory. Transportation Research Record, 2007, 1999, 30-39.	1.9	30
52	Effect of autonomous driving on traffic breakdown in mixed traffic flow: A comparison of classical ACC with three-traffic-phase-ACC (TPACC). Physica A: Statistical Mechanics and Its Applications, 2021, 562, 125315.	2.6	30
53	Traffic breakdown at a signal: classical theory versus the three-phase theory of city traffic. Journal of Statistical Mechanics: Theory and Experiment, 2014, 2014, P03001.	2.3	29
54	Synchronized flow in oversaturated city traffic. Physical Review E, 2013, 88, 054801.	2.1	28

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55	Probabilistic breakdown phenomenon at on-ramp bottlenecks in three-phase traffic theory: Congestion nucleation in spatially non-homogeneous traffic. Physica A: Statistical Mechanics and Its Applications, 2006, 364, 473-492.	2.6	27
56	Traffic Congestion, Modeling Approaches to. , 2009, , 9302-9355.		25
57	Transition from pulsating to rocking localized structures in nonlinear dissipative distributive media with global inhibition. Physica D: Nonlinear Phenomena, 1993, 69, 425-435.	2.8	21
58	On-Ramp Metering Based on Three-Phase Traffic Theory Downstream Off-Ramp and Upstream On-Ramp Bottlenecks. Transportation Research Record, 2008, 2088, 80-89.	1.9	20
59	Fuel consumption in empirical synchronised flow in urban traffic. IET Intelligent Transport Systems, 2016, 10, 122-129.	3.0	19
60	Statistical physics of synchronized traffic flow: Spatiotemporal competition between Sâ†'F and Sâ†'J instabilities. Physical Review E, 2019, 100, 012303.	2.1	19
61	Analysis of speed disturbances in empirical single vehicle probe data before traffic breakdown. IET Intelligent Transport Systems, 2017, 11, 604-612.	3.0	18
62	Probabilistic Breakdown Phenomenon at On-Ramp Bottlenecks in Three-Phase Traffic Theory. Transportation Research Record, 2006, 1965, 70-78.	1.9	17
63	Thermodiffusional autosolitons in nonequilibrium electron-hole plasma in Ge. Journal of Physics Condensed Matter, 1990, 2, 2863-2866.	1.8	16
64	Microscopic Simulation of Synchronized Flow in Oversaturated City Traffic. Transportation Research Record, 2015, 2490, 47-55.	1.9	16
65	The maximization of the network throughput ensuring free flow conditions in traffic and transportation networks: Breakdown minimization (BM) principle versus Wardropâ€™s equilibria. European Physical Journal B, 2016, 89, 1.	1.5	16
66	Autonomous driving in framework of three-phase traffic theory. Procedia Computer Science, 2018, 130, 785-790.	2.0	15
67	Prediction of moving bottleneck through the use of probe vehicles: a simulation approach in the framework of three-phase traffic theory. Journal of Intelligent Transportation Systems: Technology, Planning, and Operations, 2020, 24, 598-616.	4.2	11
68	Probabilistic Breakdown Phenomenon at On-Ramp Bottlenecks in Three-Phase Traffic Theory. Transportation Research Record, 2006, 1965, 70-78.	1.9	10
69	Test bed for simulations of the effect of a vehicle ad hoc networkÂon traffic flow. , 2015, , 223-254.		8
70	Empirical random phase transitions between free flow and synchronized flow at highway bottlenecks. Journal of Intelligent Transportation Systems: Technology, Planning, and Operations, 2020, 24, 539-555.	4.2	8
71	Traffic Breakdown, Probabilistic Theory of. , 2009, , 9282-9302.		8
72	A Study of Phase Transitions on Multilane Roads in the Framework of Three-Phase Traffic Theory. Transportation Research Record, 2009, 2124, 67-77.	1.9	7

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73	Microscopic Three-phase Traffic Theory and Its Applications for Freeway Traffic Control. , 2005, , 181-203.		7
74	Traffic Breakdown, Modeling Approaches to. , 2018, , 1-89.		6
75	Theory of Congested Highway Traffic: Empirical Features and Methods of Tracing and Prediction. , 2002, , 417-439.		5
76	Traffic Jam Warning Messages from Measured Vehicle Data with the Use of Three-Phase Traffic Theory. , 2012, , 241-250.		5
77	Breakdown in Traffic Networks. , 2019, , 21-77.		5
78	Complex Dynamics of Traffic Management: Introduction. , 2019, , 1-19.		5
79	A theory of traffic congestion at heavy bottleneckss. Journal of Physics A: Mathematical and Theoretical, 2008, 41, 369801.	2.1	4
80	Modeling Approaches to Traffic Breakdown. , 2019, , 195-283.		4
81	Traffic Breakdown, Mathematical Probabilistic Approaches to. , 2018, , 1-29.		4
82	Traffic Congestion, Spatiotemporal Features of. , 2018, , 1-116.		4
83	Autonomous Driving in the Framework of Three-Phase Traffic Theory. , 2018, , 1-44.		4
84	Spatiotemporal Features of Traffic Congestion. , 2019, , 387-500.		3
85	Autonomous Driving in the Framework of Three-Phase Traffic Theory. , 2019, , 343-385.		3
86	Increased Consumption in Oversaturated City Traffic Based on Empirical Vehicle Data. Lecture Notes in Mobility, 2014, , 71-79.	0.2	3
87	Three-Phase Traffic Flow Models. , 2009, , 221-243.		2
88	Impact of Synchronised Flow in Oversaturated City Traffic on Energy Efficiency of Conventional and Electrical Vehicles. , 2016, , 539-546.		2
89	Achievements of Empirical Studies of Traffic Breakdown at Highway Bottlenecks. , 2017, , 73-86.		2
90	Methods for Automatic Tracing and Forecasting of Spatial-Temporal Congested Patterns: A Review. , 2004, , 251-284.		2

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91	Freeway Traffic Control based on Three-Phase Traffic Theory. , 2009, , 143-172.		2
92	Optimum principle for a vehicular traffic network: Minimum probability of congestion. , 2011, , .		1
93	Complex Dynamics of Traffic Management: Introduction. , 2019, , 1-19.		1
94	Effect of Automatic Driving on Probability ofÂBreakdown in Traffic Networks. , 2017, , 275-295.		1
95	Time-Delayed Breakdown at Traffic Signal in City Traffic. , 2017, , 367-438.		1
96	Linking of Three-Phase Traffic Theory and Fundamental Diagram Approach to Traffic Flow Modeling. , 2009, , 245-252.		1
97	Earlier Theoretical Basis of Transportation Engineering: Fundamental Diagram Approach. , 2009, , 173-219.		1
98	Introductionâ€"The Reason for Paradigm Shift in Transportation Science. , 2017, , 1-71.		1
99	Nucleation Nature of Traffic Breakdownâ€"Empirical Fundamental of Transportation Science. , 2017, , 87-122.		1
100	Criticism of generally accepted fundamentals and methodologies of traffic and transportation theory. AIP Conference Proceedings, 2015, , .	0.4	0
101	Microscopic Simulations of Oversaturated City Traffic: Features of Synchronised Flow Patterns. , 2016, , 483-490.		0
102	Mathematical Probabilistic Approaches to Traffic Breakdown. , 2019, , 285-312.		0
103	How Can Empirical Spatiotemporal Traffic Dynamics Be Reconstructed Through Traffic Measurements?. , 2021, , 27-37.		0
104	Empirical Induced Traffic Breakdownâ€"Understanding Stochastic Highway Capacity. , 2021, , 85-99.		0
105	Empirical Induced Traffic Breakdownâ€"Nucleation Nature of Traffic Breakdown. , 2021, , 69-83.		0
106	Empirical Spontaneous Traffic Breakdownâ€"Fundamental Problem for Understanding Real Traffic. , 2021, , 47-67.		0
107	Empirical Nucleation Nature of Traffic Breakdownâ€"Emergence of Three-Phase Traffic Theory. , 2021, , 101-117.		0
108	Basic Empirical Spatiotemporal Phenomena in Real Traffic. , 2021, , 15-26.		0

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109	Basic Types of Empirical Spatiotemporal Congested Traffic Patterns at Bottlenecks. , 2021, , 145-161.		0
110	Spatiotemporal Traffic Congested Patterns. , 2009, , 107-135.		0
111	Nature of Traffic Breakdown at Bottleneck. , 2009, , 41-72.		0
112	Introduction to Part II:Compendium of Three-Phase Traffic Theory. , 2009, , 139-142.		0
113	Origin of Hypotheses and Terms of Three-Phase Traffic Theory. , 2009, , 99-106.		0
114	Nature of Moving Jam Emergence. , 2009, , 81-98.		0
115	Traffic Phase Dependent Fuel Consumption. , 2016, , 571-578.		0
116	The Reason for Incommensurability of Three-Phase Theory with Classical Traffic Flow Theories. , 2017, , 307-366.		0
117	Minimization of Traffic Congestion in Networks. , 2017, , 473-502.		0
118	Failure of Generally Accepted Classical Traffic Flow Theories. , 2017, , 123-186.		0
119	Deterioration of Traffic System Through Standard Dynamic Traffic Assignment in Networks. , 2017, , 503-531.		0
120	Future Automatic Driving Based on Three-Phase Theory. , 2017, , 297-306.		0
121	Maximization of Network Throughput Ensuring Free Flow Conditions in Network. , 2017, , 449-471.		0
122	Theoretical Fundamental of Transportation Scienceâ€"Breakdown Minimization (BM) Principle. , 2017, , 439-447.		0
123	Theoretical Fundamental of Transportation Scienceâ€"The Three-Phase Theory. , 2017, , 187-274.		0
124	F â†' S â†' F Transitions in Vehicle Probe Data. , 2019, , 71-78.		0
125	Microscopic Jam Tail Warning for Automated Driving. , 2019, , 79-86.		0
126	Prediction of Moving Bottleneck and Associated Traffic Phenomena for Automated Driving. , 2019, , 61-69.		0