

Hong Qin

List of Publications by Year in descending order

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148
papers

2,500
citations

257101

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39
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149
all docs

149
docs citations

149
times ranked

1011
citing authors

#	ARTICLE	IF	CITATIONS
1	Physics of Intense Charged Particle Beams in High Energy Accelerators. , 2001, , .		236
2	Why is Boris algorithm so good?. Physics of Plasmas, 2013, 20, .	0.7	193
3	Variational Symplectic Integrator for Long-Time Simulations of the Guiding-Center Motion of Charged Particles in General Magnetic Fields. Physical Review Letters, 2008, 100, 035006.	2.9	86
4	Volume-preserving algorithms for charged particle dynamics. Journal of Computational Physics, 2015, 281, 135-147.	1.9	82
5	Canonical symplectic particle-in-cell method for long-term large-scale simulations of the Vlasov-Maxwell equations. Nuclear Fusion, 2016, 56, 014001.	1.6	67
6	Explicit high-order non-canonical symplectic particle-in-cell algorithms for Vlasov-Maxwell systems. Physics of Plasmas, 2015, 22, .	0.7	65
7	A variational multi-symplectic particle-in-cell algorithm with smoothing functions for the Vlasov-Maxwell system. Physics of Plasmas, 2013, 20, .	0.7	57
8	A Paul trap configuration to simulate intense non-neutral beam propagation over large distances through a periodic focusing quadrupole magnetic field. Physics of Plasmas, 2000, 7, 1020-1025.	0.7	53
9	Variational symplectic algorithm for guiding center dynamics and its application in tokamak geometry. Physics of Plasmas, 2009, 16, 042510.	0.7	52
10	Volume-preserving algorithm for secular relativistic dynamics of charged particles. Physics of Plasmas, 2015, 22, 044501.	0.7	50
11	Hamiltonian time integrators for Vlasov-Maxwell equations. Physics of Plasmas, 2015, 22, .	0.7	46
12	Phase-space dynamics of runaway electrons in tokamaks. Physics of Plasmas, 2010, 17, .	0.7	39
13	Explicit K-symplectic algorithms for charged particle dynamics. Physics Letters, Section A: General, Atomic and Solid State Physics, 2017, 381, 568-573.	0.9	39
14	Structure-preserving geometric particle-in-cell methods for Vlasov-Maxwell systems. Plasma Science and Technology, 2018, 20, 110501.	0.7	39
15	Variational integration for ideal magnetohydrodynamics with built-in advection equations. Physics of Plasmas, 2014, 21, .	0.7	37
16	Hamiltonian particle-in-cell methods for Vlasov-Maxwell equations. Physics of Plasmas, 2016, 23, .	0.7	34
17	Explicit symplectic algorithms based on generating functions for charged particle dynamics. Physical Review E, 2016, 94, 013205.	0.8	33
18	Canonicalization and symplectic simulation of the gyrocenter dynamics in time-independent magnetic fields. Physics of Plasmas, 2014, 21, .	0.7	32

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19	Nonlinear \hat{f} simulation studies of intense charged particle beams with large temperature anisotropy. <i>Physics of Plasmas</i> , 2002, 9, 3138-3146.	0.7	31
20	Centroid and Envelope Dynamics of High-Intensity Charged-Particle Beams in an External Focusing Lattice and Oscillating Wobbler. <i>Physical Review Letters</i> , 2010, 104, 254801.	2.9	31
21	Higher order volume-preserving schemes for charged particle dynamics. <i>Journal of Computational Physics</i> , 2016, 305, 172-184.	1.9	28
22	Generalized Kapchinskij-Vladimirskij Distribution and Envelope Equation for High-Intensity Beams in a Coupled Transverse Focusing Lattice. <i>Physical Review Letters</i> , 2009, 103, 224802.	2.9	26
23	Variational symplectic particle-in-cell simulation of nonlinear mode conversion from extraordinary waves to Bernstein waves. <i>Physics of Plasmas</i> , 2015, 22, .	0.7	26
24	Explicit high-order noncanonical symplectic algorithms for ideal two-fluid systems. <i>Physics of Plasmas</i> , 2016, 23, .	0.7	26
25	Topological phases and bulk-edge correspondence of magnetized cold plasmas. <i>Nature Communications</i> , 2021, 12, 3924.	5.8	26
26	3D multispecies nonlinear perturbative particle simulations of collective processes in intense particle beams for heavy ion fusion. <i>Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment</i> , 2001, 464, 477-483.	0.7	24
27	Laser-pulse compression using magnetized plasmas. <i>Physical Review E</i> , 2017, 95, 023211.	0.8	24
28	Generalized Courant-Snyder theory for coupled transverse dynamics of charged particles in electromagnetic focusing lattices. <i>Physical Review Special Topics: Accelerators and Beams</i> , 2009, 12, .	1.8	22
29	Laser-plasma interactions in magnetized environment. <i>Physics of Plasmas</i> , 2018, 25, .	0.7	22
30	Drift compression and final focus for intense heavy ion beams with nonperiodic, time-dependent lattice. <i>Physical Review Special Topics: Accelerators and Beams</i> , 2004, 7, .	1.8	21
31	High order volume-preserving algorithms for relativistic charged particles in general electromagnetic fields. <i>Physics of Plasmas</i> , 2016, 23, 092109.	0.7	21
32	Simulations of relativistic quantum plasmas using real-time lattice scalar QED. <i>Physical Review E</i> , 2018, 97, 053206.	0.8	21
33	Machine learning and serving of discrete field theories. <i>Scientific Reports</i> , 2020, 10, 19329.	1.6	21
34	Kinetic description of neutralized drift compression and transverse focusing of intense ion charge bunches. <i>Physical Review Special Topics: Accelerators and Beams</i> , 2005, 8, .	1.8	20
35	PT-symmetry entails pseudo-Hermiticity regardless of diagonalizability. <i>Journal of Mathematical Physics</i> , 2020, 61, .	0.5	19
36	Nonlinear ponderomotive force by low frequency waves and nonresonant current drive. <i>Physics of Plasmas</i> , 2006, 13, 112307.	0.7	18

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37	Collective temperature anisotropy instabilities in intense charged particle beams. <i>Physics of Plasmas</i> , 2007, 14, 056705.	0.7	18
38	Woltjer-Taylor State without Taylor's Conjecture: Plasma Relaxation at all Wavelengths. <i>Physical Review Letters</i> , 2012, 109, 235001.	2.9	18
39	Formation of current singularity in a topologically constrained plasma. <i>Physical Review E</i> , 2016, 93, 023205.	0.8	18
40	Nonlinear \hat{f} simulations of collective effects in intense charged particle beams. <i>Physics of Plasmas</i> , 2003, 10, 2078-2086.	0.7	17
41	Symmetries and invariants of the oscillator and envelope equations with time-dependent frequency. <i>Physical Review Special Topics: Accelerators and Beams</i> , 2006, 9, .	1.8	17
42	Approach to Chandrasekhar-Kendall-Woltjer state in a chiral plasma. <i>Physical Review D</i> , 2016, 94, .	1.6	17
43	Effective-action approach to wave propagation in scalar QED plasmas. <i>Physical Review A</i> , 2016, 94, .	1.0	17
44	Kelvin-Helmholtz instability is the result of parity-time symmetry breaking. <i>Physics of Plasmas</i> , 2019, 26, .	0.7	17
45	Explicit structure-preserving geometric particle-in-cell algorithm in curvilinear orthogonal coordinate systems and its applications to whole-device 6D kinetic simulations of tokamak physics. <i>Plasma Science and Technology</i> , 2021, 23, 055102.	0.7	17
46	Nonlinear \hat{f} simulation studies of intense charged particle beams with large temperature anisotropy. <i>Laser and Particle Beams</i> , 2002, 20, 585-588.	0.4	16
47	Drift compression and final focus options for heavy ion fusion. <i>Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment</i> , 2005, 544, 255-261.	0.7	16
48	A physical parametrization of coupled transverse dynamics based on generalized Courant-Snyder theory and its applications. <i>Physics of Plasmas</i> , 2009, 16, 050705.	0.7	16
49	Generalized Courant-Snyder Theory for Charged-Particle Dynamics in General Focusing Lattices. <i>Physical Review Letters</i> , 2013, 111, 104801.	2.9	16
50	On the toroidal plasma rotations induced by lower hybrid waves. <i>Physics of Plasmas</i> , 2013, 20, .	0.7	15
51	Analytical methods for describing charged particle dynamics in general focusing lattices using generalized Courant-Snyder theory. <i>Physical Review Special Topics: Accelerators and Beams</i> , 2014, 17, .	1.8	15
52	Field theory and weak Euler-Lagrange equation for classical particle-field systems. <i>Physical Review E</i> , 2014, 90, 043102.	0.8	15
53	On the structure of the two-stream instability's complex G-Hamiltonian structure and Krein collisions between positive- and negative-action modes. <i>Physics of Plasmas</i> , 2016, 23, .	0.7	15
54	Kinetic simulations of laser parametric amplification in magnetized plasmas. <i>Physics of Plasmas</i> , 2017, 24, 093103.	0.7	15

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55	Explicit symplectic methods for solving charged particle trajectories. <i>Physics of Plasmas</i> , 2017, 24, .	0.7	15
56	An Exact Magnetic-Moment Invariant of Charged-Particle Gyromotion. <i>Physical Review Letters</i> , 2006, 96, 085003.	2.9	14
57	A new derivation of the plasma susceptibility tensor for a hot magnetized plasma without infinite sums of products of Bessel functions. <i>Physics of Plasmas</i> , 2007, 14, .	0.7	14
58	Gyrocenter-gauge kinetic algorithm for high frequency waves in magnetized plasmas. <i>Physics of Plasmas</i> , 2009, 16, 032507.	0.7	14
59	Geometric phase of the gyromotion for charged particles in a time-dependent magnetic field. <i>Physics of Plasmas</i> , 2011, 18, .	0.7	14
60	Two-stream instability with time-dependent drift velocity. <i>Physics of Plasmas</i> , 2014, 21, .	0.7	14
61	What is the fate of runaway positrons in tokamaks?. <i>Physics of Plasmas</i> , 2014, 21, .	0.7	14
62	Canonical symplectic structure and structure-preserving geometric algorithms for Schrödinger–Maxwell systems. <i>Journal of Computational Physics</i> , 2017, 349, 441-452.	1.9	14
63	The geometric theory of charge conservation in particle-in-cell simulations. <i>Journal of Plasma Physics</i> , 2020, 86, .	0.7	14
64	Variational symplectic algorithm for guiding center dynamics in the inner magnetosphere. <i>Physics of Plasmas</i> , 2011, 18, 052902.	0.7	13
65	The physics of spontaneous parity-time symmetry breaking in the Kelvin–Helmholtz instability. <i>New Journal of Physics</i> , 2020, 22, 083040.	1.2	13
66	Twiss parameters and beam matrix formulation of generalized Courant–Snyder theory for coupled transverse beam dynamics. <i>Physics of Plasmas</i> , 2010, 17, .	0.7	12
67	Generalized Courant–Snyder theory and Kapchinskij–Vladimirskij distribution for high-intensity beams in a coupled transverse focusing lattice. <i>Physics of Plasmas</i> , 2011, 18, 056708.	0.7	12
68	Class of Generalized Kapchinskij-Vladimirskij Solutions and Associated Envelope Equations for High-Intensity Charged-Particle Beams. <i>Physical Review Letters</i> , 2013, 110, 064803.	2.9	12
69	Three-wave scattering in magnetized plasmas: From cold fluid to quantized Lagrangian. <i>Physical Review E</i> , 2017, 96, 023204.	0.8	12
70	The Paul Trap Simulator Experiment. <i>Laser and Particle Beams</i> , 2003, 21, 549-552.	0.4	11
71	Collisionless pitch-angle scattering of runaway electrons. <i>Nuclear Fusion</i> , 2016, 56, 064002.	1.6	11
72	Photons, phonons, and plasmons with orbital angular momentum in plasmas. <i>Scientific Reports</i> , 2017, 7, 41731.	1.6	11

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73	Field theory and a structure-preserving geometric particle-in-cell algorithm for drift wave instability and turbulence. Nuclear Fusion, 2019, 59, 106044.	1.6	11
74	Lorentz Symmetry Group, Retardation and Energy Transformations in a Relativistic Engine. Symmetry, 2021, 13, 420.	1.1	11
75	Lorentz covariant canonical symplectic algorithms for dynamics of charged particles. Physics of Plasmas, 2016, 23, 122513.	0.7	10
76	Plasma physics in strong-field regimes: Theories and simulations. Physics of Plasmas, 2021, 28, .	0.7	10
77	Analysis of continuously rotating quadrupole focusing channels using generalized Courant-Snyder theory. Physics of Plasmas, 2013, 20, 083121.	0.7	9
78	Generalized Kapchinskij-Vladimirskij Distribution and Beam Matrix for Phase-Space Manipulations of High-Intensity Beams. Physical Review Letters, 2016, 117, 224801.	2.9	9
79	Local energy conservation law for a spatially-discretized Hamiltonian Vlasov-Maxwell system. Physics of Plasmas, 2017, 24, 062112.	0.7	9
80	Explicit symplectic algorithms based on generating functions for relativistic charged particle dynamics in time-dependent electromagnetic field. Physics of Plasmas, 2018, 25, .	0.7	9
81	Solving the Vlasov-Maxwell equations using Hamiltonian splitting. Journal of Computational Physics, 2019, 396, 381-399.	1.9	9
82	Slow manifolds of classical Pauli particle enable structure-preserving geometric algorithms for guiding center dynamics. Computer Physics Communications, 2021, 265, 107981.	3.0	9
83	Implications of the electrostatic approximation in the beam frame on the nonlinear Vlasov-Maxwell equations for intense beam propagation. Physics of Plasmas, 2002, 9, 340-344.	0.7	8
84	1D simulation studies of the ion-electron two-stream instability in heavy ion fusion beams. Laser and Particle Beams, 2003, 21, 21-26.	0.4	8
85	Explicit high-order gauge-independent symplectic algorithms for relativistic charged particle dynamics. Computer Physics Communications, 2019, 241, 19-27.	3.0	8
86	Hybrid simulation of energetic particles interacting with magnetohydrodynamics using a slow manifold algorithm and GPU acceleration. Computer Physics Communications, 2022, 275, 108313.	3.0	8
87	Study of drift compression for heavy ion beams. Laser and Particle Beams, 2002, 20, 565-568.	0.4	7
88	Centroid and envelope dynamics of charged particle beams in an oscillating wobbler and external focusing lattice for heavy ion fusion applications. Laser and Particle Beams, 2011, 29, 365-372.	0.4	7
89	On plasma rotation induced by waves in tokamaks. Physics of Plasmas, 2013, 20, 102105.	0.7	7
90	A family of new explicit, revertible, volume-preserving numerical schemes for the system of Lorentz force. Physics of Plasmas, 2016, 23, .	0.7	7

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91	Constructing Current Singularity in a 3D Line-tied Plasma. <i>Astrophysical Journal</i> , 2018, 852, 3.	1.6	7
92	Response to "Comment on "Geometric phase of the gyromotion for charged particles in a time-dependent magnetic field"" [Phys. Plasmas 19, 094701 (2012)]. <i>Physics of Plasmas</i> , 2012, 19, .	0.7	6
93	On the singularity of the Vlasov-Poisson system. <i>Physics of Plasmas</i> , 2013, 20, .	0.7	6
94	Energy-preserving algorithm for gyrocenter dynamics of charged particles. <i>Numerical Algorithms</i> , 2019, 81, 1521-1530.	1.1	6
95	Magnetohydrodynamical equilibria with current singularities and continuous rotational transform. <i>Physics of Plasmas</i> , 2019, 26, .	0.7	6
96	Spontaneous and explicit parity-time-symmetry breaking in drift-wave instabilities. <i>Physical Review E</i> , 2021, 104, 015215.	0.8	6
97	A gyrokinetic collision operator for magnetized Lorentz plasmas. <i>Physics of Plasmas</i> , 2011, 18, .	0.7	5
98	Geometric phases of the Faraday rotation of electromagnetic waves in magnetized plasmas. <i>Physics of Plasmas</i> , 2012, 19, .	0.7	5
99	Beam envelope calculations in general linear coupled lattices. <i>Physics of Plasmas</i> , 2015, 22, 013109.	0.7	5
100	Reducing noise for PIC simulations using kernel density estimation algorithm. <i>Physics of Plasmas</i> , 2018, 25, 102107.	0.7	5
101	A lattice Maxwell system with discrete space-time symmetry and local energy-momentum conservation. <i>Physics Letters, Section A: General, Atomic and Solid State Physics</i> , 2019, 383, 808-812.	0.9	5
102	Discovering exact, gauge-invariant, local energy-momentum conservation laws for the electromagnetic gyrokinetic system by high-order field theory on heterogeneous manifolds. <i>Plasma Science and Technology</i> , 2021, 23, 105103.	0.7	5
103	Noether currents for Eulerian variational principles in non-barotropic magnetohydrodynamics and topological conservations laws. <i>Journal of Fluid Mechanics</i> , 2021, 908, .	1.4	5
104	Weight growth due to resonant simulation particles and a modified \hat{f} algorithm with smooth switching between \hat{f} and total- f methods. <i>Physics of Plasmas</i> , 2008, 15, 063101.	0.7	4
105	QinetAl.Reply:. <i>Physical Review Letters</i> , 2013, 110, 269502.	2.9	4
106	<i>Physics of Plasmas</i> , 2015, 22, 056702.	0.7	4
107	Generalized parametrization methods for centroid and envelope dynamics of charged particle beams in coupled lattices. <i>Physics of Plasmas</i> , 2018, 25, 011605.	0.7	4
108	General field theory and weak Euler-Lagrange equation for classical particle-field systems in plasma physics. <i>Physics of Plasmas</i> , 2019, 26, .	0.7	4

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109	A necessary and sufficient condition for the stability of linear Hamiltonian systems with periodic coefficients. <i>Journal of Mathematical Physics</i> , 2019, 60, 022901.	0.5	4
110	Symplectic integrators with adaptive time step applied to runaway electron dynamics. <i>Numerical Algorithms</i> , 2019, 81, 1295-1309.	1.1	4
111	Simulating pitch angle scattering using an explicitly solvable energy-conserving algorithm. <i>Physical Review E</i> , 2020, 102, 033302.	0.8	4
112	Gauge-symmetrization method for energy-momentum tensors in high-order electromagnetic field theories. <i>Physical Review D</i> , 2021, 104, .	1.6	4
113	An explicitly solvable energy-conserving algorithm for pitch-angle scattering in magnetized plasmas. <i>Journal of Computational Physics</i> , 2022, 449, 110767.	1.9	4
114	3D multispecies nonlinear perturbative particle simulation of intense particle beams. , 0, , .		3
115	Drift compression of space-charge-dominated bunched beams. , 0, , .		3
116	A Nonlinear PIC Algorithm for High Frequency Waves in Magnetized Plasmas Based on Gyrocenter Gauge Kinetic Theory. <i>Communications in Computational Physics</i> , 2014, 15, 1167-1183.	0.7	3
117	Application of Lie Algebra in Constructing Volume-Preserving Algorithms for Charged Particles Dynamics. <i>Communications in Computational Physics</i> , 2016, 19, 1397-1408.	0.7	3
118	Envelope Hamiltonian for charged-particle dynamics in general linear coupled systems. <i>Physics of Plasmas</i> , 2016, 23, .	0.7	3
119	Geometric field theory and weak Euler-Lagrange equation for classical relativistic particle-field systems. <i>Frontiers of Physics</i> , 2018, 13, 1.	2.4	3
120	Linear beam stability in periodic focusing systems: Krein signature and band structure. <i>Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment</i> , 2020, 962, 163708.	0.7	3
121	Geometric electrostatic particle-in-cell algorithm on unstructured meshes. <i>Journal of Plasma Physics</i> , 2021, 87, .	0.7	3
122	3D simulation studies of the two-stream instability in intense particle beams based on the Vlasov-Maxwell equations. , 0, , .		2
123	Kinetic description of nonlinear wave and soliton excitations in coasting charged particle beams. , 2007, , .		2
124	Response to "Comment on "A new derivation of the plasma susceptibility tensor for a hot magnetized plasma without infinite sums of products of Bessel functions" [Phys. Plasmas 15, 024701 (2008)]. <i>Physics of Plasmas</i> , 2008, 15, 024702.	0.7	2
125	Kinetic studies of temperature anisotropy instability in intense charged particle beams. , 0, , .		1
126	Adiabatic formation of a matched-beam distribution for an alternating-gradient quadrupole lattice. <i>Physics of Plasmas</i> , 2009, 16, 123107.	0.7	1

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127	On the correspondence between classical geometric phase of gyro-motion and quantum Berry phase. <i>Physics of Plasmas</i> , 2017, 24, 022121.	0.7	1
128	One-dimensional kinetic description of nonlinear traveling-pulse and traveling-wave disturbances in long coasting charged particle beams. <i>Physical Review Special Topics: Accelerators and Beams</i> , 2015, 18, .	1.8	1
129	A gauge-compatible Hamiltonian splitting algorithm for particle-in-cell simulations using finite element exterior calculus. <i>Journal of Plasma Physics</i> , 2022, 88, .	0.7	1
130	Intense nonneutral beam propagation through a periodic focusing quadrupole field – A compact Paul trap configuration to simulate beam propagation over large distances. , 1999, , .		0
131	Intense nonneutral beam propagation through a periodic focusing quadrupole field – Hamiltonian averaging techniques in the smooth-focusing approximation. , 1999, , .		0
132	Kinetic description of electron-proton instability in high-intensity linacs and storage rings. , 0, , .		0
133	Periodically-focused solutions to the nonlinear Vlasov-Maxwell equations for intense beam propagation through an alternating-gradient quadrupole field. , 0, , .		0
134	Electromagnetic (Darwin) model for three-dimensional perturbative particle simulation of high intensity beams. , 0, , .		0
135	Paul Trap Simulator Experiment (PTSX) to simulate intense beam propagation through a periodic quadrupole focusing field. , 0, , .		0
136	Paul Trap Simulator Experiment (PTSX) to simulate intense beam propagation through a periodic focusing quadrupole field. <i>AIP Conference Proceedings</i> , 2002, , .	0.3	0
137	Simulation studies of the ion-electron two-stream instability in IBX. , 2003, , .		0
138	Instability driven by wall impedance in intense charged particle beams. , 0, , .		0
139	Nonlinear Particle Simulations of Collective Effects in High-Intensity Bunched Beams. , 0, , .		0
140	Symmetries and Invariants of the Time-Dependent Oscillator Equation and the Envelope Equation. , 0, , .		0
141	Anisotropy-Driven Instability in Intense Charged Particle Beams. , 0, , .		0
142	Gyrocenter Gauge Theory and Algorithm for Nonlinear Particle Simulations of Radio-Frequency Waves in Plasmas. <i>AIP Conference Proceedings</i> , 2007, , .	0.3	0
143	High Frequency Gyrokinetic Particle-in-Cell Simulation: Application to Heating of Magnetically Confined Plasmas. <i>AIP Conference Proceedings</i> , 2007, , .	0.3	0
144	Nonlinear particle simulations of energy-anisotropy instabilities in high-intensity bunched beams. , 2007, , .		0

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145	Self-similar nonlinear dynamical solutions for one-component nonneutral plasma in a time-dependent linear focusing field. <i>Physics of Plasmas</i> , 2011, 18, .	0.7	0
146	Solving Vlasov-Maxwell equations by using Hamiltonian splitting. <i>AIP Conference Proceedings</i> , 2017, , .	0.3	0
147	Preface to Special Topic: Collective Effects in Particle Beams and Nonneutral Plasmas. <i>Physics of Plasmas</i> , 2018, 25, 011501.	0.7	0
148	Nonlinear \hat{F} simulation studies of intense charged particle beams with large pressure anisotropy. , 0, , .		0