NONEXTENSIVE STATISTICAL MECHANICS
AND THERMODYNAMICS: BIBLIOGRAPHY *

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GENERAL THEORY

Generalized entropy and thermostatistics: [1]
Connection to thermodynamics, ensembles and Jaynes' information theory: [2–1537]
H-theorem and irreversibility: [1538–1569]
Ehrenfest theorem, von Neumann equation: [3, 1570–1576]
Quantum statistics: [1577–1676]
Variational and perturbative methods; Bogolyubov inequality; Green functions; Path integral; Boltzmann equation: [1590, 1677–1763]
Langevin and Fokker-Planck equations: [1542, 1575, 1581, 1745, 1764–2132]
Fluctuation-dissipation, Nyquist and Onsager reciprocity theorems, Kubo’s linear response theory and Kramers-Kronig relation: [6, 2133–2148]
Poisson equation: [2149–2158]
Callen identity: [2159]
Ising transmissivity: [2160]
Classical equipartition principle: [2161–2163]
Connection with quantum uncertainty: [2164–2198]
Connection with Fisher information measure: [2199–2211]
Connection with ergodicity, nonlinear dynamical systems, self-organized criticality, cellular automata, fractals: [9, 43, 48–50, 1651, 2212–2571]
Connection with general relativity, cosmology, dark energy, string theory: [2200, 2572–2650]
Connection with quantum groups and quantum mechanics: [2651–2694]
Connection with wavelets; Signal processing; EEG: [2695–2760]
Connection with quantum correlated many-body problems: [2761–2770]
Connection with the Gentile and the exclusion Haldane statistics: [2771–2774]
Connection with finite systems: [2133, 2771]
Rigorous results (generalized entropy and thermostatistics): [2215–2220, 2775–2780]
Integral transformations (Hilhorst and Prato formulae): [1579, 2133, 2781–2783]

ONE-BODY SYSTEMS

Two-level system: [1, 2784]
Harmonic oscillator: [837, 845, 2779, 2784–2786]
Free particle: [2787]
Larmor precession: [1572]
Rigid rotator: [2782, 2788–2790]
Hydrogen and hydrogen-like atoms: [1004, 1005, 2791–2810]

*This regularly updated Bibliography (at http://tsallis.cat.cbpf.br/biblio.htm) contains 6160 articles from 12636 signing (co)authors. It does not address the vast existing literature addressing nonextensive thermodynamical anomalies, but only articles including at least one substantial relation with nonadditive entropies, nonextensive statistical mechanics and thermodynamics. It is a fairly complete listing whose indexation is, however, only indicative.
MANY-BODY SYSTEMS

Ideal, classical gases, and other toy models: [2133, 2161, 2781, 2811–2835]
Independent spin paramagnet, Landau magnetism: [2656, 2659–2662, 2836–2842]
Black-body radiation and photonic systems: [2843–2890]
$d = 1$ Ising ferromagnet: [2891–2895]
$d \geq 2$ Ising and other ferromagnets: [2160, 2896–2937]
Infinite-range Ising ferromagnet: [2938]
Potts ferromagnet, Molecular field approximation: [2159, 2913, 2939–2942]
Percolation: [2943–2945]
Electron-phonon systems; tight-binding-like Hamiltonians; nanosystems; theoretical chemistry: [2946–3001]

APPLICATIONS

Self-gravitating systems, Stellar polytropes, Vlasov equation, Galaxies, Galaxy clusters: [1728, 2149, 2200, 3002–3128]
Turbulence; Granular matter; Viscous fingering; Navier-Stokes equation; Boltzmann equation; Mossbauer effect: [2149, 3174–3177, 3186–3408]
Solar neutrinos; High energy physics: [3409–3801]
Ferrofluid-like materials, Lennard-Jones fluids: [2930, 3802–3823]
Solitons: [3824, 3825]
Plasma (electron velocity distribution, magnetohydrodynamics): [3826–4087, 4089–4180]
Glass, Spin-glass: [4181–4213]
Superfluid helium; Bose-Einstein condensation: [4214–4229]
Test of Boltzmann-Gibbs thermostatistics: [2576, 2860, 2861]
Cosmic rays; Elementary particles: [3783, 4230–4437]
Biological systems; Microemulsions; Liquid crystals: [4438–4524]
Stochastic resonance; Brownian motors: [4525–4560]
Connection with the Theory of perceptions: [16]
Connection with the Theory of finances: [6, 4546, 4547, 4549–4551, 4561–4713]
Consistent testing; Statistical inference; Theory of probabilities: [462–501, 1724, 4714–4749]
Theory of functions; Geometric approaches: [1067–1073, 1075–1083, 1085–1109, 1112–1150, 4750–4945]
Simulated annealing and optimization techniques; Monte Carlo (Genetics, Traveling salesman problem, Data fitting curves, Quantum chemistry, Gravity models, Lennard-Jones clusters, Thomson model, spin systems, proteins, nucleic acids): [1746, 2924, 4946–5224]
Neural and other networks: [4496, 4497, 5225–5324]
Analysis of time series (nonlinear dynamics, epilepsy, earthquakes, economics) and images: [2695–2700, 2708–2710, 2713–2716, 5325–5797]
Geophysics: [2715, 2716, 5387, 5798–5850]
Medicine: Tomography: [2717, 2722–2724, 5325, 5567, 5851–5900]
Symbolic dynamics, linguistics, philology, cognitive sciences, hydrology, ecology: [2252, 2254, 2282–2289, 4900, 5901–6023]

GENERAL READING

Generalized thermostatistics; Generalized distributions: [413, 6024–6160]
References


[263] Q.A. Wang, L. Nivanen, A. Le Mehaute and M. Pezeril, Note on Abe’ s general pseudoadditivity for nonextensive systems, preprint (2001) [cond-mat/0111541].


[390] L. Velazquez and F. Guzman, Softening the extensive postulates, preprint (2001) [cond-mat/0107441].
[399] Q.A. Wang, Many-body $q$-exponential distribution prescribed by factorization hypothesis, preprint (2001) [cond-mat/0112217].
[402] H. Touchette, When is a quantity additive, and when is it extensive?, Physica A 305, 84 (2002).


F. Topsoe, *Interaction between truth and belief as the key to entropy and other quantities of statistical physics*, preprint (2008), 0807.4337[math-phys].


M. Portesi, Information geometry for physical systems using generalized measures of distance, communication at XV Conference on Nonequilibrium Statistical Mechanics and Nonlinear Physics (4-8 December 2006, Mar del Plata, Argentina).


H. Matsuzoe, Hessian structures on deformed exponential families and their conformal structures, Differential Geometry and its Applications (2014), in press, doi: http://dx.doi.org/10.1016/j.difgeo.2014.06.003

S. Amari, Differential geometry derived from divergence functions: Information geometry approach, Mathematics of Distances and Applications (2012).


B.N. Tiwari, V. Chandra and S. Banerjee, A thermodynamic geometric study of Renyi and Tsallis entropies, preprint (2010), 1008.2853 [cond-mat.stat-mech].


[980] Q.A. Wang, L. Nivanen and A. Le Mehaute, A composition of different q nonextensive systems with the normalized expectation based on escort probability, preprint (2006) [cond-mat/0601255].


[1244] T. Yamano, Universality of thermodynamical Legendre transform structure against the statistical entropy and the expectation value, Proceeding of the meeting on Quantum Theory of Thermo-field and its Applications, Soryushiron Kenkyu (Kyoto) 103, 104-107 (2001)[in Japanese].


G.L. Gilardoni, *On a Gel’fand-Yaglom-Peres theorem for f-divergences*, preprint (2009), 0911.1934 [cs.IT].

H. Hasegawa, *Validity of the factorization approximation and correlation induced by nonextensivity in N-unit independent systems*, preprint (2009), 0912.0521 [cond-mat.stat-mech].


G. Samid, *Shannon revisited - Considering a more tractable expression to measure and manage intractability, uncertainty, risk, ignorance, and entropy*, preprint (2010), 1006.1055 [cs.IT].


J.L. Du, On the power-law q-distribution function based on the probabilistically independent postulate in nonextensive statistics, preprint (2010), 1012.2765 [cond-mat.stat-mech].


T. Yamano, When index of escort mean is different from nonextensive entropy index, preprint (2010).


N. Ebrahimi, N.Y. Jalali and E.S. Soofi, Comparison, utility, and partition of dependence under absolutely continuous and singular distributions, Multivariate Analysis (2014), in press, doi: http://dx.doi.org/10.1016/j.jmva.2014.06.014


V. Kumar and H.C. Taneja, Non-additive entropy measure and record values, Applied Mathematics Information Sciences 9 (3), 1541-1548 (2015).


M. Campisi, *Comment on “Tsallis power laws and finite baths with negative heat capacity”*, preprint (2013), 1310.5556 [cond-mat.stat-mech].


[1626] F.A. Wudarski, Non-Markovian dynamics in the open quantum systems, Doctor Thesis (Nicolaus Copernicus University, Faculty of Physics, Astronomy and Informatics, 2015).
[1638] T. Yamano, Bounds for $\alpha$-divergence and a generalized divergence of Tsallis, communicated at the Research Institute of Mathematical Science Workshop on Mathematical Aspects of Generalized Entropies and their Applications (7-9 July 2009, Kyoto).


G. Jumarie, Derivation of an amplitude of information in the setting of a new family of fractional entropies, Information Sciences 216, 113-137 (2012).


J.A. Lopez-Saldivar, A. Figueroa, O. Castanos, R. Lopez-Pena, M.A. Manko and V.I. Manko, Discretization of the density matrix as a nonlinear positive map and entanglement, preprint (2016), 1607.00982 [quant-ph].


[1976] V. Svoboda, Generalized stochastic processes with applications to financial markets, Master Thesis (Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Department of Physics, 2016).
[1979] F. Li, Modelling the stock market using a multi-scale approach, Master Thesis (University of Leicester, School of Management, University of Leicester, 2017).


[2024] R.S. Gonzalez, Difusao anomala: Transicao entre os regimes localizado e estendido na caminhada do turista unidimensional, Master Thesis (University of Sao Paulo, Ribeirao Preto, August 2006).


[2033] J. Du, Possible dynamics of the Tsallis distribution from a Fokker-Planck equation (I), preprint (2009), 0905.4310 [cond-mat.stat-mech].


[2063] J. Ruseckas, Modeling Tsallis distributions by nonlinear stochastic differential equations with application to financial markets, communication at the APFA7 and Tokyo Tech-Hitotsubashi Interdisciplinary Conference (Tokyo, 1 to 5 March 2009).


A closer look at coupled logistic maps at the edge of chaos, preprint (2015), 1612.03658 [cond-mat.stat-mech].


G.L. Vasconcelos and D.S.P. Salazar, Multicanonical distribution and the origin of power laws, preprint (2012), 1208.5624 [cond-mat.stat-mech].


A.O. Bolivar, Anomalous Brownian motion via linear Fokker-Planck equations, preprint (2017), arxiv 1701.02670


[2262] P.D. Batista, I.C. Marques, L.H. de Almeida Fauth and M.O.R. Brandao, *Web of Science: showing a bug today that can mislead scientific research output’s prediction*, preprint (2016), arxiv 1611.01548


A.M.C. de Souza, *Estudos sobre o ensemble de Wishart-Tsallis de matrices aleatorias*, communicated at the 2nd Workshop of the National Institute of Science and Technology for Complex Systems (Rio de Janeiro, 1-5 March 2010).


[2362] A. Prestes, Thermodynamic nonextensivity and elastoplasticity: Determining the Tsallis entropic index $q$ for a SOC system by the multifractal function $f_{\alpha}$, preprint (1999).


D. Moroni, *Dinamica e termodinamica di un modello XY con lunghezza di interazione variabile*, Tesi di Laurea (In Italian) (Universita degli Studi di Roma La Sapienza, 1999).


A. Robledo, Critical attractors and q-statistics, Lecture Course at the CBPF School on Nonextensive Statistical Mechanics (Rio de Janeiro, 2-6 April 2007).

E. Mayoral and A. Robledo, Tsallis’ q index and Mori’s q phase transitions at edge of chaos, Phys. Rev. E 72, 026209 (2005).


A. Robledo, Unorthodox properties of critical clusters, Molecular Physics 103, 3025-3030 (2005).


M.D. Shrimali and S. Banerjee, q-deformed logistic map with delay feedback, preprint (2012), 1203.3137 [nlin.CD].


[2559] T.D. Frank, Chaos from nonlinear Markov processes: Why the whole is different from the sum of its parts, Physica A 388, 4241-4247 (2009).


F. Markus and K. Gambar, Q-boson system below the critical temperature, Physica A 293, 533 (2001).


A. Gulec, *Ozet fraktallarin yogan madde fiziginde uygulamaları*, Doctor Thesis (Ege University, Izmir, Turkey, February 1997).


106


P.R. del Santoro, Aproximacao de campo molecular do modelo de Potts generalizado, Master Thesis (Universidade de Sao Paulo-Brazil, 1994).


990-1010 (2005).
[462] Z. Chen and X. Xu, Multifractality can be a universal signature of phase transitions, preprint (2013), 1304.3189 [cond-mat.stat-mech].
A note on bounded entropies

P.-O. Amblard and C. Vignat,

C. Vignat, A.O. Hero III and J.A. Costa,

S. Abe and A.K. Rajagopal,

A. Plastino and A.R. Plastino,

C. Vignat and A. Plastino,

C. Vignat and A. Plastino,

C. Vignat and J. Naudts,

C. Vignat, A.O. Hero III and J.A. Costa,

C. Anteneodo and C. Tsallis,

R.S. Mendes and C. Tsallis,

F.A. Oliveira, J.A. Cordeiro and A.S. Chaves,

F.A. Oliveira, B.A. Mello and I.M. Xavier,

H.B. Qiu, H.Y. Song and S.B. Liu,

P. Eslami, M. Mottaghizadeh and H.R. Pakzad,

P. Eslami, M. Mottaghizadeh and H.R. Pakzad,

P. Eslami, M. Mottaghizadeh and H.R. Pakzad,

P. Eslami, M. Mottaghizadeh and H.R. Pakzad,

P. Eslami, M. Mottaghizadeh and H.R. Pakzad,


[3379] G. Livadiotis and D.J. McComas, Non-equilibrium stationary states in the heliosphere and the influence of pick-up ions, in Pickup Ions Throughout the Heliosphere and Beyond 1302, 70-76 (2010).


[3392] B. Layden, Second-order nonlinear processes in warm unmagnetized plasmas, Doctor Thesis (School of Physics, Faculty of Science, University of Sydney, December 2013).


[3492] E. Appelt, *Measurements of charged-particle transverse momentum spectra in PbPb collisions at $\sqrt{s_{NN}} = 2.76\,\mathrm{TeV}$ and in pPb Collisions at $\sqrt{s_{NN}} = 5.02\,\mathrm{TeV}$ with the CMS detector*, Doctor Thesis (Vanderbilt University, Nashville, Tennessee, 2014).


[3544] A. Badala (ALICE Collaboration), Hadronic resonance production measured by the ALICE detector at LHC energies, EPJ Web of Conferences 95, 04002 (2015) (7 pages), doi: 10.1051/epjconf/20159504002


ALICE Collaboration *Production of Σ(1385)\(^\pm\) and Ξ(1530)\(^0\) in p – Pb collisions at \(\sqrt{s_{NN}} = 5.02\) TeV*, preprint (2017), 1701.07797 [nucl-ex].


T.S. Biro and Z. Neda, *Dynamical stationarity as a result of sustained random growth*, preprint (2016), 1611.06698 [cond-mat.stat-mech].


Yu. V. Kharlov (ALICE Collaboration), *Physics with the ALICE experiment*, Physics of Atomic Nuclei **76** (12), 1497-1506 (2013) [Elementary Particles and Fields-Experiment].


M.S. Kayl, *Measurement of the charged particle density with the ATLAS detector: First data at \(s = 0.9, 2.36\) and 7 TeV*, Doctor Thesis (University of Amsterdam, 2016).


B. De, Non-extensive statistics and a systematic study of meson-spectra at LHC energy $\sqrt{s(\text{NN})} = 2.76$ TeV, preprint (2014), 1408.5811 [nucl-th].


D. Rohrscheid and G. Wolschin, Charged-hadron production in the three-sources RDM at LHC energies, EPJ Web of Conferences 70, 00074 (2014) (13 pages), http://dx.doi.org/10.1051/epjconf/20147000074

G. Wolschin, Beyond the thermal model in relativistic heavy-ion collisions, Physical Review C 94 (2), 024911 (2016).


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160


N.A. Alves and R.B. Frigori, Superstatistics and the quest of generalized ensembles equivalence in a system with long-range interactions, preprint (2015), 1512.01502 [cond-mat.stat-mech].


J. Rozynek, Non-extensive distributions for a relativistic Fermi gas, preprint (2015), 1506.00469 [nucl-th].


A. Bialas and A. Bzdak, Two-particle correlations in high-energy jets from statistical clusters, preprint (2015), 1508.04235 [hep-ph].


[4369] G. Wilk, Surprisingly close Tsallis fits to high transverse momentum hadrons produced at LHC, communicated at the IX Workshop on Correlation and Femtoscopy (5-8 November 2013, Acireale, Italy).


[4382] ALICE Collaboration, Hyperon production in $p$ collisions at $\sqrt{s} = 7$ TeV at the LHC with ALICE, EPJ Web of Conferences 97, 00005 (2015) (4 pages), doi: 10.1051/epjconf/20159700005


[4430] LHCb Collaboration, *Study of the production of \( \Lambda_b \) and \( \bar{B}^0 \) hadrons in pp collisions and first measurement of the \( \Lambda_b \rightarrow J/\psi pK^- \) branching fraction*, Chinese Physics C **40** (1), 011001 (2016) (16 pages).


T. Oikonomou, Skepsis on the scenario of Biological Evolution provided by stochastic models, preprint (2008), 0803.3471 [cond-mat.stat-mech].


null


[4548] D. Prenga, M. Ifti and S. Kovaci, Extended views on the study of out-of-equilibrium opinion and opinion-like systems, The International Physics Conference Tirana 2015, 43-48 (University of Tirana, Faculty of Natural Sciences, Department of Physics, 2015).


[4726] D.R. Bickel, *Time-series intermittency quantified by generalized entropy: An alternative to multifractal analysis*, communicated at the "International Workshop on Classical and Quantum Complexity and Nonextensive Thermodynamics" (Denton, Texas, 3-6 April 2000).


[4846] E. Marcon, *Practical estimation of diversity from abundance data*, (2015), HAL Id: hal-01212435 https://hal-agroparistech.archives-ouvertes.fr/hal-01212435


A.D. Anastasiadis, G.D. Magoulas, G. Georgoulas and A. Tzes,
M. A. Moret, P. M. Bisch, E. Nogueira Jr. and P. G. Pascutti,
M. Habeck, W. Rieping and M. Nilges,
Y. Xiang, S. Gubian, B. Suomela and J. Hoeng,
M.C.R. Melo, R.C. Bernardi, T.V.A. Fernandes and P.G. Pascutti,
E. Farkash,
Y.G. Spill, G. Bouvier and M. Nilges,
M.R. Guevara, D. Hartmann and M. Mendoza,
Y. Koveos, A. Anastasiadis, G. Georgoulas, A. Tzes and D. Tsahalis,
A. Dall’ Igna Jr., R.S. Silva, K.C. Mundim and L.E. Dardenne,
J.G. Kim, Y. Fukunishi, A. Kidera and H. Nakamura,
I. Fukuda and H. Nakamura,
Y. Xiang, S. Gubian, B. Suomela and J. Hoeng,
E.R. Correia, V.B. Nascimento, C.M.C. Castilho, A.S.C. Esperidiao, E.A. Soares and V.E. Carvalho,
J.J. Deng, H.S. Chen, C.L. Chang and Z.X. Yang,
J.G. Kim, Y. Fukunishi, A. Kidera and H. Nakamura,
Y. Xiang, S. Gubian, B. Suomela and J. Hoeng,
M.C.R. Melo, R.C. Bernardi, T.V.A. Fernandes and P.G. Pascutti,
E. Farkash,


[5306] Z. Szabo, Information theoretical estimators, ITE Toolbox Release 0.51 (December 29, 2013).


[5459] F. Nie, A three-level thresholding technique based on nonextensive entropy and fuzzy partition with artificial bee colony algorithm, Internat. J. Hybrid Information Technology 8 (7), 1-10 (2015), doi: http://dx.doi.org/10.14257/ijhit.2015.8.7.01


group model for brain development*, in Genes, Brain and Behavior (Blackwell, 2012) (19 pages), doi:
10.1111/gbb.12005.

filtering*, Neurocomputing 119, 139-143 (2013), http://dx.doi.org/10.1016/j.neucom.2012.03.035


maximum entropy approach*, IEEE CNF, 3rd EuroNGI Conference on Next Generation Internet Networks

International Conference on Neural Networks and Signal Processing (Nanjing, China, 14-17 December 2003),
pages 806-809.

two-dimensional Tsallis Entropy with modified pulse-coupled neural networks*, Engineering Applications
Artificial Intelligence 24, 625637 (2011).

[5492] Y.B. Gong, X. Lin, Y.H. Hao and X.G. Ma, *Non-Gaussian noise and coupling-induced firing transitions of

[5493] L. Montangie and F. Montani, *Quantifying higher-order correlations in a neuronal pool*, Physica A 421,

[5494] L. Montangie and F. Montani, *Higher-order correlations in common input shapes the output spiking activity

[5495] A. Ben Hamza, *Nonextensive information-theoretic measure for image edge detection*, J. Electronic Imaging

(2015), 1504.01799 [cs.IT].

[5497] H. Singh, G. Kaur and N. Gupta, *Robust edge detector using back propagation neural network with multi-
thresholding*, IEEE International Conference on Computational Intelligence and Computing Research (2014)
(6 pages).


IEEE International Conference on Microwave Technology and Computational Electromagnetics (ICMTCE),


[5503] W. Mohamed, Y. Zhang, A. Ben Hamza and N. Bouguila, *Stochastic optimization approach for entropic

[5504] K. Tarmissi and A. Ben Hamza, *Information-theoretic hashing of 3D objects using spectral graph theory,


elimination and its application to wireless capsule endoscopy*, SIViP [DOI 10.1007/s11760-012-0384-3]

[5507] S. Liao, J. Sun, Y. Chen, Y. Wang and P. Zhang, *Distributed power control for wireless networks via the
http://dx.doi.org/10.1016/j.jnca.2015.05.005

[5508] N. Cvejic, C.N. Canagarajah and D.R. Bull, *Image fusion metric based on mutual information and Tsallis

information and entropy driven quadtree decomposition*, Electronics Lett. 46 (18), 1266-1268 (2010).


R.S. Sneddon, SNEDDON AND ASSOC INC (SNED-Non-standard), *Data value measuring method for electro encephalography data, involves computing attribute for each data subset so that attribute is dependent on data in each subset and attribute is equal to variability of data in each data subset*, Patent US2005159919-A1 (2005-540950).


M.M. DiStasio and C.T. Bock, *Data packet collection and monitoring computer system for e.g. security system functions, has wireless access point and data collection platform provided to calculate entropy of determined estimate of received signal strength*, Assignee: Syracuse Res. Corp., US2010226255-A1 (2010).


X. Bai, J. Chen and H. Li, *Local corrosion detecting method for horizontal well sleeve in oil field, involves outputting sleeve local corrosion information in neuron network according to calculating result of input Tsallis wavelet energy entropy*, Assignee: Harbin Inst Technology, CN101650327-A (2010).
The Tsallis entropy of natural information

R. Sneddon,

X. Li and Q. Xu,

Monte Carlo illumination self-adaptive method for image processing field, involves sampling voltage of pixel when value is larger than threshold value, and utilizing sampling points to increase another threshold value according to rule, Patent Number(s): CN102289842-A, Patent Assignee Name(s) and Code(s): UNIV TIANJIN(UTIJ-C)


J.-F. Bercher, Entropies et criteres entropiques, preprint (2014), https://hal.archives-ouvertes.fr/hal-01087503


S.M.D. Queiros, On the distribution of high-frequency stock market traded volume: A dynamical scenario, preprint (2005) [cond-mat/0502337].


218
[5734] L. Telesca, *A non-extensive approach in investigating the seismicity of L’ Aquila area (central Italy), struck by the 6 April 2009 earthquake (ML = 5.8)*, Terra Nova 22(2), 87-93 (2010).


[5810] D. Koutsoyiannis, The scaling properties in the distribution of hydrological variables as a result of the maximum entropy principle, communicated at European Geosciences Union General Assembly (24-29 April 2005, Vienna).


