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Transport properties, Lyapunov exponents, and entropy per unit time. (English)

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Summary: For dynamical systems of large spatial extension giving rise to transport phenomena, like the Lorentz gas, we establish a relationship between the transport coefficient and the difference between the positive Lyapunov exponent and the Kolmogorov-Sinai entropy per unit time, characterizing the fractal and chaotic repeller of trapped trajectories. Consequences for nonequilibrium statistical mechanics are discussed.

MSC:

82C70 Transport processes in time-dependent statistical mechanics

37A60 Dynamical aspects of statistical mechanics

Cited in **39** Documents

Full Text: [DOI](#)

References:

- [1] , Rev. Mod. Phys. 57 pp 617– (1985)
- [2] , Phys. Rev. A 38 pp 427– (1988)
- [3] , Physica (Amsterdam) 13D pp 55– (1984)
- [4] , Phys. Rev. Lett. 62 pp 233– (1989)
- [5] , Phys. Rev. Lett. 64 pp 2339– (1990)
- [6] , Phys. Rev. A 40 pp 6130– (1989)
- [7] , Phys. Rev. A 36 pp 1374– (1987)
- [8] , Rev. Mod. Phys. 53 pp 569– (1980)
- [9] , Rev. Mod. Phys. 54 pp 195– (1982)
- [10] , Phys. Rev. Lett. 50 pp 1959– (1983)
- [11] , J. Stat. Phys. 32 pp 555– (1983)
- [12] , Commun. Math. Phys. 78 pp 247– (1980)
- [13] , Phys. Rev. Lett. 48 pp 7– (1982)
- [14] , Phys. Rev. A 26 pp 504– (1982)
- [15] , in: Dynamical Systems, Theory and Applications (1975)
- [16] , Commun. Math. Phys. 65 pp 295– (1979)
- [17] , J. Chem. Phys. 90 pp 2225– (1989)
- [18] , J. Chem. Phys. 90 pp 2242– (1989)
- [19] , J. Chem. Phys. 90 pp 2255– (1989)
- [20] , J. Phys. A 20 pp 5971– (1987)
- [21] , Proc. Natl. Acad. Sci. U.S.A. 81 pp 1276– (1984)
- [22] , in: The Fractal Geometry of Nature (1982)
- [23] , Physica (Amsterdam) 17D pp 75– (1985)
- [24] , Bol. Soc. Bras. Mat. 9 pp 83– (1978)
- [25] , J. Chem. Phys. 84 pp 2649– (1986)
- [26] , J. Phys. A 19 pp L829– (1986)
- [27] , J. Phys. A 20 pp 3607– (1987)
- [28] , J. Phys. A 22 pp 2925– (1989)
- [29] , Physica (Amsterdam) 33D pp 89– (1988)
- [30] , Physica (Amsterdam) 33D pp 132– (1988)
- [31] , Physica (Amsterdam) 35D pp 34– (1989)

- [32] , Phys. Rev. Lett. 63 pp 919– (1989)
- [33] , Phys. Rev. Lett. 64 pp 1617– (1990)
- [34] , Phys. Lett. A 145 pp 93– (1990)
- [35] , Ergod. Theory Dynam. Syst. 2 pp 109– (1982)
- [36] , in: An Introduction to Probability Theory and Its Applications (1971)
- [37] , J. Stat. Phys. 12 pp 217– (1975)
- [38] , in: Stochastic Processes in Physics and Chemistry (1981) · [Zbl 0511.60038](#)
- [39] , J. Stat. Phys. 42 pp 3– (1986)
- [40] , in: Equilibrium and Nonequilibrium Statistical Mechanics (1975) · [Zbl 0984.82500](#)

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