

STATISTICAL PHYSICS SEMINAR

June 26th, 2017.

Monday, 10.00

ELTE TTK Northern Building 1.125

László B. Kish

Department of Electrical and Computer Engineering, Texas A&M
University

Facts and myths about zero-point thermal noise and Information entropy versus thermal entropy

- The existence of non-zero Johnson noise when approaching zero temperature has been debated many times, yet it is almost generally accepted. We point out that the acceptance of non-zero zero-point noise leads to perpetual motion machines that violate the Second Law of Thermodynamics. The Fluctuation-Dissipation Theorem for voltage/current noise is unacceptable in its present form in the quantum limit and the correct theoretical result must depend on the particular type of noise measurement system.

- Information entropy and thermal entropy are apples and oranges and they do not generally obey Brillouin's principle and never satisfy Landauer's erasure dissipation principle for memories.

[1] L.B. Kish, G.A. Niklasson, C.G. Granqvist, "Zero-point term and quantum effects in the Johnson noise of resistors: A critical appraisal", J. Stat. Mech. 2016 (2016) 054006.

[2] L.B. Kish, G.A. Niklasson, C.G. Granqvist, "Zero thermal noise in resistors at zero temperature", Fluct. Noise. Lett. 15 (2016) 1640001.

[3] L.B. Kish, D.K. Ferry, "Information entropy and thermal entropy: apples and oranges", arXiv:1706.01459

1117. Budapest, Pázmány Péter sétány 1/A (Északi tömb)

Room 1.125

<http://glu.elte.hu/~statfiz/index.html>