

ENERGY DISSIPATION AND
TIME-IRREVERSIBILITY OF FLUCTUATIONS

A. G. Sitenko

Bogolubov Institute for Theoretical Physics,
Nat. Acad. Sci. of Ukraine
(14b, Metrolohichna Str., Kyiv 03143, Ukraine;
E-mail: ositenko@gluk.apc.org)

S u m m a r y

The relationship of classical and quantum fluctuations is discussed. Fluctuations in classical systems are regarded as the $\hbar \rightarrow 0$ limiting case of quantum fluctuations. Fluctuations in systems with energy dissipation are shown to be time-irreversible. The relation between the antisymmetric spectral correlation function and the imaginary part of the coefficient of linear response to external perturbations is formulated as the basic relation of the fluctuation theory. The reason for the antisymmetric correlation function to be nonzero is time irreversibility of fluctuations rather than their quantum nature. The antisymmetric correlation function in the space-time representation is shown to be imaginary as distinct from the symmetric correlation function that is real.