

QUANTUM-THERMAL FLUCTUATIONS
OF EFFECTIVE MACROPARAMETERS
AND THEIR CORRELATIONS

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S u m m a r y

The application of the conventional theory of macroparameter fluctuations has been shown to go beyond the framework of thermodynamic description in a number of cases. The principles of the theory of quantum-thermal fluctuations of effective macroparameters and their correlations have been formulated. The theory satisfies the applicability conditions of equilibrium thermodynamics and is based on effective macroparameters, which take into account the integral stochastic action of the environment at any temperatures. The correlator of conjugate macroparameters, namely, the effective entropy and the effective temperature, has been calculated. The correlator was found to be proportional to the effective action that characterizes the stochastic environment. The pair correlators for conjugate effective parameters “entropy–temperature” and “coordinate–momentum” have been demonstrated to depend linearly on the effective action, with their minimum values being determined by Planck’s constant.