

# First Principles of the Classical Mechanics and the Foundations of Statistical Mechanics on the Example of a Disordered Spin System

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## Abstract

We study the classical multicomponent disordered 3D spin system taking into account the temperature of the medium in the framework of the model of nearest neighbors. The latter allows the 3D problem with a cubic lattice to reduce to the 1D Heisenberg spin glass problem with a random environment. Using the Hamilton equations of motion, a recurrent equation is obtained that connects three spins in successive nodes of 1D lattice, taking into account the influence of a random environment. This equation, together with the corresponding conditions of a local minimum energy in nodes, allows to construct node-by-node a stable spin chains and, accordingly, to calculate all parameters of statistical ensemble from the first principles of classical mechanics, without using any additional assumptions, in particular, the main axiom of statistical mechanics – the equiprobability of statistical states. Using the example of 1D Heisenberg spin glass model, the features of the new approach are studied in detail and the statistical mechanics of the system are constructed without using the standard representation of the partition function (PF).