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The second law of thermodynamics for high-energy channeled particles. (English. Russian original) [Zbl 1201.80002](#)

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The number of kinetic equations which lie behind the proof of the second law of thermodynamics is rather limited in the microscopic theory. This paper proves that the second law of thermodynamics is satisfied for high-energy particles, which move in a crystal in the channeling regime. This explicit proof involves a local Boltzmann equation for the distribution function of the particles written in the Bogoliubov form. Here, one statistical mechanism is taken into account, namely the scattering of channeled particles on lattice atoms randomly dislocated from the crystal sites.

Reviewer: [Viktor Shevchuk \(Lviv\)](#)

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[80A05](#) Foundations of thermodynamics and heat transfer

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[thermodynamics](#); [second law](#); [channeled particle](#); [crystal](#); [Boltzmann kinetic equation](#); [thermal scattering](#); [distribution function](#); [entropy](#); [entropy source](#); [local entropy balance equation](#)

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