

Abstract Submitted
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**The Role of Walls' Stochastic Forces in Statistical Mechanics –
Irreversibility and Transition from One Microstate to Large Number of
Microstates** MADHAV GAUTAM, PURU GUJRATI, The University of Akron —

A statistical system, by definition, experiences uncontrollable stochastic interactions with the surrounding and allow for irreversibility.⁽¹⁾ A purely deterministic system will not show any irreversibility.⁽²⁾ One can model the walls of the container containing a system to be the source of these stochastic impulses. We present the results of such stochastic walls' impulses on a single particle in a one-dimensional box of a fixed length. At each collision with the walls, the velocity changes due to stochastic impulses so that the velocity becomes unpredictable. After a long period of time, a single initial velocity results in a distribution of velocities. If the strength of the impulse is not too strong, the average kinetic energy reaches a finite limit, so that it can be used to define the temperature.

1) “Irreversibility, molecular Chaos, and A simple proof of the second law” P.D.Gujrati, <http://arxiv.org/abs/0803.1099> (arXiv:0803.1099)

2) “Poincare Recurrence, Zermelo's Second Law Paradox, and Probabilistic Origin in Statistical Mechanics” P.D.Gujrati, <http://arxiv.org/abs/0803.0983> (arXiv:0803.0983)

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