Abstract Submitted
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Irreversibility, Poincare Recurrence and Stochasticity in Statistical Mechanics PURU GUJRATI, The University of Akron — We will show that deterministic dynamics always leads to the conservation of entropy and Poincare recurrence.[1] Thus, recurrence is incompatible with entropy change. The law of increase of entropy can only occur for systems with stochastic dynamics, and the irreversibility emerges out of their indeterminate evolution,[2] as we will discuss. This stochasticity requires some weak but uncontrollable interaction of the system with outside or the walls of the container. Boltzmann infuses this stochasticity in his deterministic approach by invoking the assumption of molecular chaos. The molecular chaos cannot emerge out of deterministic dynamics, as shown elsewhere in this meeting.[3]

[1]P.D. Gujrati, Poincare Recurrence, Zermelo's Second Law Paradox, and Probabilistic Origin in Statistical Mechanics, http://arxiv.org/abs/0803.0983 (arXiv:0803.0983)
[2]P.D. Gujrati, Irreversibility, Molecular Chaos, and A Simple Proof of the Second Law, http://arxiv.org/abs/0803.1099 (arXiv:0803.1099)
[3]Pradeep Fernando and P.D. Gujrati (poster)

Puru Gujrati
The University of Akron

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