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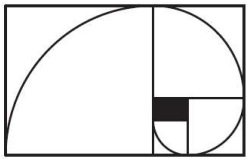

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On the construction and identification of Boltzmann processes

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Abstract. Given the existence of a solution $\{f(t,x,z)\}_{t\geq 0}$ of the Boltzmann equation for hard spheres, we introduce a stochastic differential equation driven by a Poisson random measure that depends on the densities $\{f(t,x,z)\}_{t\geq 0}$. The marginal distributions of its solution solve a linearized Boltzmann equation in the weak form. Further, if the distributions admit a probability density, we establish, under suitable conditions, that the density at each t coincides with the solution of the Boltzmann equation $f(t,x,z)$. The stochastic process is therefore called the Boltzmann process.

Keywords. Boltzmann equation, Poisson random measures, stochastic differential equations, relative entropy.

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