ERRATA

Lyapunov Exponents and Kolmogorov-Sinai Entropy for the Lorentz Gas at Low Densities [Phys. Rev. Lett. 74, 4412 (1995)]

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The expression for the Lyapunov exponent for the trajectories of the moving particle on the fractal repeller for an open Lorentz gas in Eq. (18) of our Letter is in error. In calculating this quantity a factor was left out which correctly weights the trajectories that remain on the repeller and removes the contribution of those that eventually leave the system. For a particle starting at some phase point inside the system, $x = (\mathbf{r}, \boldsymbol{v})$ at time t, this factor is the survival probability, i.e., the probability that the particle will still be inside the system at a time T later (to be more precise, it is the ensemble average of this quantity over many realizations of the configuration of scatterers). Then one needs to take the limit as $T \to \infty$. The correct expression is

$$\lambda^+ = \lambda_0^+ + \frac{3l^2}{8}\left(\lambda_0 - \frac{v}{2l}\right)J\,,$$

where λ_0^+ is the equilibrium Lyapunov exponent, given in Eq. (9), l is the mean free path length of the moving particle, v is the speed of the particle, and J is

$$J = \left(\int [\nabla n_m(\mathbf{r}, t)]^2\, d\mathbf{r}\right)\left(\int n_m(\mathbf{r}, t)^2\, d\mathbf{r}\right)^{-1}$$

Here $n_m(\mathbf{r}, t)$ is the average spatial density for the moving particle in the system at long times t. Details of this correction and extensions of the Boltzmann equation method to the calculation of negative Lyapunov exponents, and to the low density, three dimensional Lorentz gas will be given in a future publication. The authors would like to thank Dr. Arnulf Latz for helpful discussions.

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