Primary Data Description: A new theory of randomness

All data are produced by the following MATLAB scripts given below in blue. They are based on equilibrium solutions of the Lorenz 1963 model obtained after having integrated the Lorenz model starting from an arbitrary initial condition for some time.

Note the variable symbols used in the paper are not identical to those used in the Matlab scripts

	Scripts	Functions & data needed
Figure 2	get_int_ns a) calculates pairs of $(x_{i\tau}, G_{\tau,i\tau})$ along an equilibrium solution, b) regresses $G_{\tau,i\tau}$ against $x_{i\tau}$ to obtain the intercept, regression slop, and the residual. plot_reg_ns plots $G_{\tau,i\tau}$ against $x_{i\tau}$ and lists the respective statistics	lorz: calculates an Lorenz solution lorz_int: calculates pairs of $(x_{i\tau}, G_{\tau,i\tau})$ from a Lorenz solution, and also the linear damping to be used for Fig.7
Figure 3	get_int_nn calculates from G_τ, the intercept c_τ, the slope d_τ, the variance of the residual, and a few other statistics, all as functions of number n of data points used their calculations. get_int_nn needs to be run twice, one for tau=2 (tau is denoted as s in the Matlab script) and one for tau=10000 plot_int_nn plots c_τ and d_τ as functions of n	lorz lorz_int
Figure 4	get_df_relation derives the regression slope d and the variance v of the residual for tau=1,2,…, 1000, each from 1e+6 data points. get_df_relation_cos derives d and v for the cosine model using analytical expressions of the solution and the corresponding integral forcing ff are used to calculate the intercept and slope by function cos_cdv.m) plot_df_2 plots the results of both get_df_relation and get_df_relation_cos	lorz lorz_int cos_cdv: calculates for the cosine model dx/dt=cos(2*pi*t/P) with period P: the intercept, the slope and the residual variance
Figure 5	get_int_ns_d calculates slope d and variance v of residual as functions of s (=τ= number of time steps over which the integral forcing is calculated) plot_d_ns plots the results	
Figure 6	get_int_ns_small is identical to get_int_ns, but for small values of s (τ) plot_acf_er calculates the auto-correlation function of the time series of residual, which is outputted by get_int_ns and get_int_ns_small, and plots the auto-correlation function	
Figure 7	get_int_ns_tau1 calculates slope d_1 associated with integral forcing G_1 as a function of integration time step dt plot_d_dt plots the result	

	Scripts	Functions & data needed
Figure 8	**get_int_ns_cos** produces for the cosine model the scatter diagrams of $x(iT)$ against $G_T(iT)$ using analytical solutions calculated by the function cos_int_cont_full **plot_reg_cos** plots the result	**cos_int_cont_full** calculates for the cosine model both the analytical and the numerical values of $(x_{i\tau}, G_{\tau,i\tau})$ **cos_cd** calculates for the cosine model the intercept c and the slope d