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Generalized Huberman-Rudnick scaling law and robustness of q-Gaussian probability distributions

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We generalize Huberman-Rudnick universal scaling law [1] for all periodic windows of the logistic map and show the robustness of q-Gaussian probability distributions [2] in the vicinity of chaos threshold. Our scaling relation is universal for the self-similar windows of the map which exhibit period-doubling subharmonic bifurcations. Using this generalized scaling argument, for all periodic windows, as chaos threshold is approached [3], a developing convergence to q-Gaussian is numerically obtained both in the central regions and tails of the probability distributions of sums of iterates.

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