

## Reply to “Comment on ‘Strange nonchaotic attractors in autonomous and periodically driven systems’”

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We discuss the appearance of a strange nonchaotic attractor in a wide class of dynamical systems when the destruction of ergodic torus takes place. [S1063-651X(97)11210-7]

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Let us consider the problem of existence of strange nonchaotic attractors (SNA) in a wide class of dynamical systems from two points of view: the theory of oscillations and bifurcation theory.

In [1–3] the appearance of SNA is associated with a torus destruction and described as a route from quasiperiodicity to chaos. Therefore systems where SNA is observed should be characterized by the presence of at least two incommensurate frequencies with irrational ratio. Quasiperiodic oscillations can be generated in different ways. It is known that regions of ergodic quasiperiodic motion in the parameter space of autonomous and periodically driven systems as well as in quasiperiodically driven systems have nonzero measure.

Hence nothing seems to prevent the existence of SNA in those systems.

In [4] the collision of a period-doubled torus with its unstable parent has been suggested as one of the mechanisms for the creation of strange nonchaotic attractors. We have found such bifurcation at some values of parameters [5]. But according to the accurate calculations from the “Comment” it does not lead to SNA. Is this bifurcation unknown up to now and leading to the appearance of a chaotic set?

We took into account the valuable remarks from the “Comment” concerning numerical experiments. But we proceeded to present evidence of the existence of SNA in autonomous and periodically driven systems.

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[1] C. Grebogi, E. Ott, S. Pelikan, and J. A. Yorke, *Physica D* **13**, 261 (1984).

[2] M. Ding, C. Grebogi, and E. Ott, *Phys. Rev. A* **39**, 2593 (1989).

[3] U. Feudel, J. Kurths, and A. Pikovsky, *Physica D* **88**,

176 (1995).

[4] J. F. Heagy and S. M. Hammel, *Physica D* **70**, 140 (1994).

[5] V. S. Anishchenko, T. E. Vadivasova, and O. Sosnovtseva, *Phys. Rev. E* **54**, 3231 (1996).