

ON DYNAMICAL SYSTEMS WITH MIXED DYNAMICS

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We say that a dynamical system possesses “mixed dynamics” if:

- (i) it has simultaneously infinitely many hyperbolic periodic orbits of all possible types (stable, saddle of all indexes of stability, completely unstable) and
- (ii) these orbits are not separated as a whole, i.e. the closures of sets of orbits of different types have nonempty intersections.

The phenomenon of mixed dynamics was discovered in our paper [Gonchenko, Shilnikov, Turaev, 1997, Proc. Steklov Math. Inst] where it was shown that it can be generic, i.e. systems with mixed dynamics fill residual subsets from open regions (in fact, Newhouse regions) of systems.

In the talk we give a review of the corresponding results, discuss related problems and consider in more detail the phenomenon of mixed dynamics in reversible systems for which it has a fundamental meaning.