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Dense chaos

Abstract: According to A. Lasota, a continuous function f from a real compact interval I into itself is called generically chaotic if the set of all points (x, y), for which $\liminf_{n \to \infty} |f^n(x) - f^n(y)| = 0$ and $\limsup_{n \to \infty} |f^n(x) - f^n(y)| > 0$, is residual in $I \times I$. Being inspired by this definition we say that f is densely chaotic if this set is dense in $I \times I$. A characterization of the generically chaotic functions is known. In the paper the densely chaotic functions are characterized and it is proved that in the class of piecewise monotone maps with finite number of pieces the notion of dense chaos and that of generic chaos coincide.