ACCESSIBILITY AND EVERYWHERE CHAOS

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ABSTRACT. A TDS (X, f) is called N-*accessible* if for any $\varepsilon > 0$ and any N nonempty open subsets $U_1, U_2, \cdots, U_N$ of X there are N points $x_1 \in U_1, x_2 \in U_2, \cdots, x_N \in U_N$ and a positive integer n such that $\max\{d(f^n(x_i), f^n(x_j)) : i, j \in \{1, 2, \cdots, N\}\} < \varepsilon$. A TDS (X, f) is called N-*sensitive* if there is a positive number τ such that in every nonempty open subset U of X there are N distinct points $x_1, x_2, \cdots, x_N$ of U and a positive integer n with $\min\{d(f^n(x_i), f^n(x_j)) : i, j \in \{1, 2, \cdots, N\}, i \neq j\} > \tau$. A TDS (X, f) is called (N_1, N_2)-*everywhere chaotic* if it is N_1-sensitive and N_2-accessible. We point out that there is a system which is (N_1, N_2)-everywhere chaotic, but it is not $(N_1 + 1, N_2)$-everywhere chaotic for any positive integers N_1 and N_2.

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