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ERRATUM TO "RANDOMIZATION OF SHARKOVSKII-TYPE THEOREMS"

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In order to apply the general randomization scheme developed in our recent paper [An], we presented there several illustrative examples demonstrating the coexistence of random orbits of all orders. In one of these examples (Example 3), instead of two different pictures in Figure 3, only one picture occurred incorrectly twice.

The purpose of this erratum therefore is to eliminate this misprint by recalling Example 3, but with both pictures in Figure 3 (see next page) to make the argument clear.

Example 3. Unlike the function

$$f_2(x) = \begin{cases} 1 - x + 2(x-\frac{1}{2})^2 \sin\left(\frac{1}{x-\frac{1}{2}}\right), \text{ for } x \in \mathbb{R} \setminus \left\{\frac{1}{2}\right\}, \\ \frac{1}{2}, \text{ for } x = \frac{1}{2}, \end{cases}$$

which seems to have only 2-orbits and fixed points, its discontinuous (at $x = \frac{1}{2}$) derivative

$$f_2'(x) = \begin{cases} -1 + 4(x-\frac{1}{2}) \sin\left(\frac{1}{x-\frac{1}{2}}\right) - 2\cos\left(\frac{1}{x-\frac{1}{2}}\right), \text{ for } x \in \mathbb{R} \setminus \left\{\frac{1}{2}\right\}, \\ -1, \text{ for } x = \frac{1}{2}, \end{cases}$$

plotted together with its third iterate ${f_2'}^3$ in Figure 3, admits evidently (by comparison of the graphs of f_2' and ${f_2'}^3$) 3-periodic orbits. Thus, according to the Sharkovskii-type theorem for derivatives [Sz], f_2' possesses k-orbits, for every $k \in \mathbb{N}$.

Hence, additively perturbing f_2' by $p : \Omega \to \mathbb{R}$, where p is a measurable function such that $|p(\omega)| \leq 0.1$, for almost all $\omega \in \Omega$, we obtain the random map $f : \Omega \times \mathbb{R} \to \mathbb{R}$, defined as $f(\omega, x) := f_2'(x) + p(\omega)$, for all $(\omega, x) \in \Omega \times \mathbb{R}$.

Since the behaviour of the discontinuous (at $x = \frac{1}{2}$) function $f(\omega, \cdot) = f_2'(\cdot) + p(\omega)$, $\omega \in \Omega$, and its third iterate $f^3(\omega, \cdot) : \mathbb{R} \to \mathbb{R}$, $\omega \in \Omega$, does not qualitatively differ much from the unperturbed functions f_2' and ${f_2'}^3$, Theorem 2 in [An] (cf. Remark 3 in [An]) implies the existence of random n-orbits of f, for every $n \in \mathbb{N}$.

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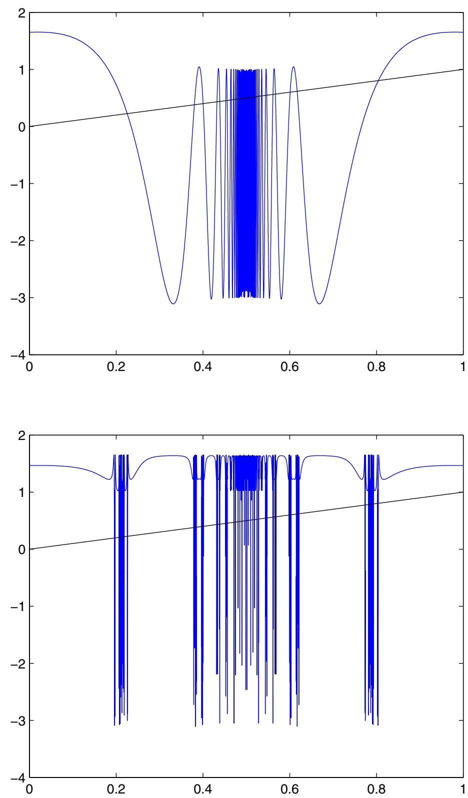

FIGURE 3. Graphs of f_2' and ${f_2'}^3$

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