Mathematics > Dynamical Systems

Sharkovskii order for non-wandering points

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(Submitted on 20 Jul 2011)

For a map $f:I \rightarrow I$, a point $x \in I$ is periodic with period $p \in \mathbb{N}$ if $f^p(x)=x$ and $f^j(x)\not=x$ for all $0<j<p$. When f is continuous and I is an interval, a theorem due to Sharkovskii (\cite{BC}) states that there is an order in $\mathbb{N}$, say $\lhd$, such that, if f has a periodic point of period p and $p \lhd q$, then f also has a periodic point of period q. In this work, we will see how an extension of this order $\lhd$ to an ultrapower of the integer numbers yields a Sharkovskii-type result for non-wandering points of f.

Comments:	9 pages
Subjects:	**Dynamical Systems (math.DS)**
MSC classes:	primary 37E05, 26E35, secondary 54J05
Cite as:	**arXiv:1107.3945 [math.DS]**
	(or **arXiv:1107.3945v1 [math.DS]** for this version)

Submission history

From: Fernando Moreira [view email]
[v1] Wed, 20 Jul 2011 11:31:46 GMT (8kb)

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