Heteroclinic picture. A-diffeomorphism
Stochastic Lager

Let $0$ be a fixed point

$$T: z \mapsto z + z' \pmod{1}$$

Def. Stable manifold for the critical point $y$ if

1) $x \in y^s(y) \Rightarrow T^x \in y^s(y)$
2) $T^x(T^y(y)) = T^y(T^x(y))$.

Def. Point $A$ is called homoclinic to $0$ if $A \in y^s(0) \cap y^u(0)$.

Assume now that $T^p(0) = 0$, and $T^p(0) \neq 0$.

Then $T^p(0)$ is hyperbolic fixed point for $T^p$. Then it has $y^s(T^p(0))$, $y^u(T^p(0))$.

$$y^s(T^p(0)) = T^{u_1} - u_2 \cdot y^s(T^{u_2}(0))$$

Def. $A$ is called heteroclinic to $0$ if $A \in y^s(T^u(0)) \cap y^u(T^s(0))$.

We would say that $A$ is transversal heteroclinic if angle between $y^s$ and $y^u$ is not zero.
Consider $B = T^{-1} A$
$B' = T^{-1} A'$

Then
1) $B, B'$ are also homologous
2) $T$ also transves
A linear system \((x, \Phi)\) is stable.

Let \(W(\cdot)\) be a neigh of \(\Phi\) in \(C^1\)-topology.

\(\forall \Phi \in W(\cdot) \exists k : x \to x : \Phi = k \circ \Phi \circ k^{-1}\)

\(\sup_{x} d(k(x), x) \leq \varepsilon, \quad \sup \varepsilon \leq 3\varepsilon\)

1) Th. (Sinai) \(\exists \varepsilon_0\) \(\forall \varepsilon < \varepsilon_0\) \(\exists m\)

2) \(\exists m' : d(\Phi^m(x), \Phi^m(x)) \leq \varepsilon\) \(T_m\)

\(K : m \to m'\)

\(\Phi(m) \quad \Phi^m(x) \quad \Phi(x) \quad \Phi^m(m) \quad \Phi^m(x) \quad \Phi^m(m) \leq \varepsilon\)

Pfo of Sinai's Thm.

\(T_m(x) \Phi \text{ acts on } T_m x\)

\(\Phi^* : T_m \to T_m \text{ differential of } \Phi\)

\(\Phi^*\) is a contraction in the vicinity of \((\Phi(x))^*\)

\(\|\Phi^* p_1 - \Phi^* p_2\| \leq \Theta \|p_1 - p_2\| \quad \text{if } \|p_1 - p_2\| < \delta\)
But if (x) Then by contraction mapping
then it follows I fixed point for $g^+$

which is $p$ for sure
but for $p' \neq p$

\[ p' = \lim_{n \to \infty} (g' * *)^n \times \]

\[ \phi' * p'(m) = p'(\phi'(m)) \].