

Smale-Williams type attractors in 3-manifolds

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We study how to realize Smale-Williams solenoid type attractors in 3-manifolds.

(1) Smale solenoid type

It is already known that we can restrict the 3-manifolds to lens spaces. We get all Smale solenoids realized in a given lens space through an inductive construction. We turn this around to address the question of how to decide whether a closed braid is a trivial knot in S^3 . For a diffeomorphism f of a 3-manifold M that realizes a Smale solenoid, it is natural to ask whether f^{-1} also realizes a Smale solenoid. We relate this question to exchangeable braids, and for some special positive case, we describe the relation between the two Smale solenoids of f and f^{-1} .

(2) Smale-Williams solenoid type

Using alternating Heegaard diagram, we construct a self-diffeomorphism g of some manifolds M , such that the nonwandering set of g , $\Omega(g)$, is a union of genus 2 Smale-Williams solenoids. And among other thing, we prove that if $\Omega(g)$ is a union of K type genus two Smale-Williams solenoids, then the Heegaard genus of the closed manifold M is at most two.

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