shadowing lemma

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Let M be a Riemannian manifold, $f\colon M \to M$ a diffeomorphism and $\Lambda \subset M$ a compact hyperbolic set for f. Then there is a neighborhood U of Λ such that for every $\delta > 0$ there is an $\epsilon > 0$ so that every ϵ-http://planetmath.org/PseudoOrbit orbit in U is δ-shadowed by an orbit of f.

Moreover, there is $\delta_0 > 0$ such that, if $\delta < \delta_0$ and if the pseudo-orbit is bi-infinite, then the shadowing orbit is unique; and if Λ has a local product structure then the shadowing orbit is in Λ.