962-B1-48   **Victoria Rayskin*** (`vrayskin@bu.edu`), 101 Monmouth St.#218, Brookline, MA 02446.
Tangential Homoclinic Intersections in $\mathbf{R}^n$. Preliminary report.

The well known λ-Lemma states the following: Let f be a C^1-diffeomorphism of $\mathbf{R}^n$ with a hyperbolic fixed point at 0 and m- and p-dimensional stable and unstable manifolds W^S and W^U, respectively ($m + p = n$). Let D be a p-disk in W^U and w be another p-disk in W^U meeting W^S at some point a transversely. Then $\bigcup_{n \geq 0} f^n(w)$ contains p-disks arbitrarily C^1-close to D. In this paper we will show that a similar assertion still holds outside of an arbitrarily small neighborhood of 0, even in the case of tangential homoclinic intersections with finite order of contact, if we make a low order non-resonance assumption. We also show that this assumption is a necessary one in dimensions higher than 2.

For the case of a homoclinic intersection with an infinite order of contact we present a counter-example for our Tangential λ-Lemma. Using the Tangential λ-Lemma we prove that one can find a transverse crossing arbitrarily close to a degenerate crossing if the homoclinic point is a point of finite order of contact. This generalizes the Birkhoff-Smale Theorem. Although we show that for planar dynamics non-resonance assumption is redundant. (Received July 05, 2000)

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