SHADOWING, CHAIN TRANSITIVITY AND OMEGA LIMIT SETS

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Let $f : X \to X$ be continuous map on a compact metric space. A subset A of X is internally chain transitive provided for any $\delta > 0$ and any two points x and y in A, there is a δ-pseudo orbit of points in A starting at x and ending at y. It is well known that omega limit sets are internally chain transitive, and for some systems such as Shifts of Finite Type, a set is internally chain transitive if an only if it is an omega limit set. Moreover if f has shadowing and the set of omega limit sets is closed in the Hausdorff metric, (for example any map of the closed interval with shadowing), then again a set is internally chain transitive if an only if it is an omega limit set.

In this talk we consider under what conditions omega limit sets are completely characterized by internal chain transitivity. It turns out that variants of Pilyugins notion of orbital shadowing are what is required