

Chaos and indecomposability of continua

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Abstract: This is a joint work with U. Darji in Tsukuba, 2014. We use recent developments in local entropy theory to prove that positive topological entropy implies the existence of chaos in dynamical systems and complicated structures in the underlying spaces.

In 1994, Barge and Diamond proved that if G is a finite graph and $f : G \rightarrow G$ is any map with positive topological entropy, then the inverse limit space $\varprojlim(X, f)$ contains an indecomposable continuum. In 2011, Mouron proved that if X is a chainable continuum which admits a homeomorphism f with positive topological entropy, then X contains an indecomposable subcontinuum. In this talk, we generalize the results of Barge, Diamond and Mouron. We show that if X is a G -like continuum for some finite graph G and $f : X \rightarrow X$ is a any homeomorphism with positive topological entropy, then X contains an indecomposable continuum. Moreover, if X is a G -like continuum for some finite tree G and $f : X \rightarrow X$ is a any monotone map with positive topological entropy, then X contains an indecomposable continuum. This answers some questions raised by Mouron and generalizes the theorem of Barge and Diamond.

Recently, we know that C. Mouron have also same results as our main results, independently.

Dynamical properties of maps with zero-dimensional sets of periodic points

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Abstract: These are joint works with my students: Y. Ikegami, A. Ueda and M. Hiraki. In this talk, we study the following dynamical properties of maps with zero-dimensional sets of periodic points: Colorings and eventually colorings, compactifications and periodic points, zero-dimensional covers, dynamical decomposition theorems of spaces.