Expansive homeomorphisms of the plane.

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April 30, 2008

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Abstract

This article tackles the problem of the classification of expansive homeomorphisms of the plane. Necessary and sufficient conditions for a homeomorphism to be conjugate to a linear hyperbolic automorphism will be presented. The techniques involve topological and metric aspects of the plane. The use of a Lyapunov metric function which defines the same topology as the one induced by the usual metric but that, in general, is not equivalent to it is an example of such techniques. The discovery of a hypothesis about the behavior of Lyapunov functions at infinity allows us to generalize some results that are valid in the compact context. Additional local properties allow us to obtain another classification theorem.