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A GENERALIZED DEFINITION OF TOPOLOGICAL ENTROPY

LOUIS BLOCK, JAMES KEESLING, AND LENKA RUCKA

Abstract. Given an arbitrary (not necessarily continuous) function of a topological space to itself, we associate a non-negative extended real number which we call the continuity entropy of the function. In the case where the space is compact and the function is continuous, the continuity entropy of the map is equal to the usual topological entropy of the map. We show that some of the standard properties of topological entropy hold for continuity entropy, but some do not. We show that for piecewise continuous piecewise monotone maps of the interval the continuity entropy agrees with the entropy defined in *Horseshoes and entropy for piecewise continuous piecewise monotone maps* by Michał Misiurewicz and Krystina Ziemian Finally, we show that if f is a continuous map of the interval to itself and g is any function of the interval to itself which agrees with f at all but countably many points, then the continuity entropies of f and g are equal.

1. Introduction

Topological entropy has become a useful tool for recognizing, quantifying, and classifying the complicated dynamics of continuous maps. Topological entropy was first defined in [1] for a continuous map of a compact topological space to itself. In [9] and [10] an alternate definition was given in the case of a uniformly continuous map of a metric space to itself, and it was shown that this alternate definition coincides with the definition given in [1] in the case of a continuous map of a compact metric space to itself. Another idea which has been explored is to define

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