RELATIVE METRIC SPACES

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Abstract
In this paper the notion of a relative metric space, as a mathematical model compatible with a physical phenomena, is considered. The notion of relative topological entropy for relative semi-dynamical systems on a relative metric space is studied. It is proved that observational topological entropy is an invariant object up to a relative conjugate relation.

Keywords: Observer, Relative structure, Molecular lattice, Relative topology, Observational topological entropy.


1. Introduction
The theory of fuzzy systems [16] was the reason for considering new theories of uncertainty [2, 3]. The recent mathematical results of fuzzy theory [16] in topology [1, 4, 10, 11, 12, 13, 14], and geometry [7] created a new approach to considering space. An Observer, as one of the main objects which determines the uncertainty of a space \( X \), can be considered as a fuzzy set \( \mu : X \rightarrow [0,1] \). Any mathematical model according to the viewpoint of an observer \( \mu \) is called a relative model [4, 5, 6, 8].

There is a space description using fuzzy theory which is called fuzzy metric spaces [1, 10]. In this paper relative metric spaces are introduced as another approach for considering space by using an observer. A method for constructing relative topologies via a relative metric space is presented. The notion of relative entropy for relative semi-dynamical systems created by a relative continuous map on a relative metric space is considered. The relative entropy for the iteration of a relative continuous map is studied.

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