

Dynamics of finite-multivalued transformations

Igudesman K.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

We consider a transformation of a normalized measure space such that the image of any point is a finite set. We call such a transformation an m -transformation. In this case the orbit of any point looks like a tree. In the study of m -transformations we are interested in the properties of the trees. An m -transformation generates a stochastic kernel and a new measure. Using these objects, we introduce analogies of some main concept of ergodic theory: ergodicity, Koopman and Frobenius-Perron operators etc. We prove ergodic theorems and consider examples. We also indicate possible applications to fractal geometry and give a generalization of our construction.

Keywords

Dynamic system, Ergodic theory, Self-similar set