

Generalized Markov shift spaces and their thermodynamic formalism

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Abstract

In 1999, R. Exel and M. Laca generalized the notion of Cuntz-Krieger algebras for infinitely many states. In a similar fashion to the finite symbol case, this generalization also carries a shift space X_A that includes its respective standard Markov shift space as a dense subset. The space X_A is locally compact, and in many cases it is compact, and the new elements are finite words. We started the thermodynamic formalism on X_A . We extended the notions of conformal measures, Ruelle's operator, and its eigenmeasures for this space. New conformal measures and eigenmeasures that are not detected by the standard theory were discovered. A notion of pressure introduced by M. Denker and M. Yuri for Iterated Function Systems (IFS) considers both infinite and finite words is a natural definition for the generalized Markov shift space, and we proved that in many cases this pressure coincides with the Gurevich pressure. For transitive shift spaces, even for those with infinite Gurevich entropy, we found new conformal measures. New phase transition phenomena were found, and in the case of the eigenmeasures, we have an explicit example in which the eigenmeasure passes from living on the standard shift to living on its complement, after a critical inverse of temperature value.