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Dynamical entropy in operator algebras. (English) Zbl 1109.46002

Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge 50. Berlin: Springer (ISBN 3-540-34670-8/hbk). x, 296 p. (2006).

In the book, the two most successful approaches to the extensions of measure entropy and topological entropy to the noncommutative setting are presented and analysed. The book consists of two parts. In the first part, the basic theory for the dynamical and topological entropies is developed. Contents of the chapters of the first part: (1) Some background material on entropy in the classical commutative case. There is a definition of entropy via partitions of unity, in a form which is more suitable for generalization to the noncommutative case; (2) Relative entropy for states on C^*-algebras and its properties; (3) The join of n partitions as a function of the partitions and its noncommutative analogue; (4) Maximality of entropy and commutativity; (5) The existence of dynamical abelian models (X, μ, T) together with equivariant maps $A \to L^\infty(X, \mu)$ allowing to compute the entropy; (6) The extensions of topological entropy to C^*-algebras; 7) Dynamics on state space; (8) Crossed products; (9) Variational principle.

In the second part dynamical systems in more special settings are considered. Contents of these chapters: (10) Relative entropy and subfactors; (11) K-systems, automorphisms of noncommutative tori; (12) Entropy of binary shifts; (13) Bogolubov automorphisms; (14) Free products.

Reviewer: Victor Sharapov (Volgograd)

MSC:

46-02 Research exposition (monographs, survey articles) pertaining to functional analysis
46L55 Noncommutative dynamical systems
28D20 Entropy and other invariants

Keywords:

noncommutative ergodic theory; dynamical entropy; topological entropy

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