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Froyland, Gary (D-PDRB); **Junge, Oliver** (D-PDRB); **Ochs, Gunter** (D-BRMN-DY)
Rigorous computation of topological entropy with respect to a finite partition. (English summary)
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The authors present an effective method of estimating the topological entropy $h(T)$ of a continuous map T on a space M. For a fixed partition $\mathcal{A} = \{A_1, A_2, \dots, A_q\}$ they define an "intuitive" topological entropy with respect to $\mathcal{A}$,

$$h^*(T,\mathcal{A}) = \lim_{N\to\infty} \frac{1}{N} \log |\mathcal{W}_N(T,\mathcal{A})|,$$

where $\mathcal{W}_N(T,\mathcal{A})$ is the set of all possible strings $(n_0, n_1, n_2, \dots, n_{N-1})$ such that for some $x \in M$, $T^i x \in A_{n_i}$, $0 \le i \le N-1$. They prove that $h(T) \le \liminf_{\operatorname{diam} \mathcal{A}\to 0} h^*(T,\mathcal{A})$ and present an algorithm to calculate $h^*(T,\mathcal{A})$. It involves the construction of a special sofic shift and finding its entropy using the maximal eigenvalue of an associated matrix.

A number of 1-, 2- and 3-dimensional examples are given and the details of computer implementation of the method are discussed. Although the authors claim only an upper bound for the entropy, the results for the 1-dimensional logistic family are very close to the theoretical values.

Reviewed by *Paweł Gora*

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