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Substitution dynamical systems. Spectral analysis. 2nd ed. (English) Zbl 1225.11001

Lecture Notes in Mathematics 1294. Dordrecht: Springer (ISBN 978-3-642-11211-9/pbk; 978-3-642-11212-6/ebook). xv, 351 p. (2010).

The first edition of this classical book appeared in 1987 [Substitution dynamical systems – spectral analysis. *Lecture Notes in Mathematics*, 1294. Berlin etc.: Springer-Verlag (1987; [Zbl 0642.28013](#))]. Since then, a large number of papers were devoted to automatic and substitutive (morphic) sequences including studies of associated dynamical systems and their spectral analysis. This new edition will make this book even more essential. The author intended to correct a few misprints but she was led to add chapters and to update the list of references. Chapters 1 to 12 correspond to the same chapters as in the first edition (addressing: Spectral theory of unitary operators and of dynamical systems, Dynamical Systems associated with sequences and arising from substitutions, Eigenvalues of substitutive dynamical systems, Matrices of measures, Matrix Riesz products, bijective automata, Maximal spectral type and spectral multiplicity of general automata, Compact automata). Two new chapters address respectively Schrödinger operators with substitutive potential, and substitutive continued fractions.

The list of references contains about a hundred of items that have appeared since the first edition. All this makes this new edition a very important book that everybody interested in automatic and substitutive (morphic) sequences and their associated dynamical systems should definitely possess.

Please note that some references are now available in journals: [32] *E. Bombieri and J. Bourgain*, *J. Eur. Math. Soc. (JEMS)* 11, No. 3, 627–703 (2009; [Zbl 1170.42001](#)); [65] *M. J. Crabb, J. Duncan and C. M. McGregor*, *Semigroup Forum* 81, No. 1, 71–84 (2010; [Zbl 1202.37014](#)); [181] *C. Mauduit and J. Rivat*, *Ann. Math. (2)* 171, No. 3, 1591–1646 (2010; [Zbl 1213.11025](#)).

Reviewer: [Jean-Paul Allouche \(Paris\)](#)

MSC:

- [11-02](#) Research exposition (monographs, survey articles) pertaining to number theory
- [28-02](#) Research exposition (monographs, survey articles) pertaining to measure and integration
- [37-02](#) Research exposition (monographs, survey articles) pertaining to dynamical systems and ergodic theory
- [28D99](#) Measure-theoretic ergodic theory
- [11K55](#) Metric theory of other algorithms and expansions; measure and Hausdorff dimension
- [11B85](#) Automata sequences
- [37B10](#) Symbolic dynamics

Cited in **2** Reviews
Cited in **110** Documents

Keywords:

[substitution dynamical systems](#); [automata sequences](#); [morphic sequences](#); [spectral analysis](#); [Riesz products](#); [Schrödinger operators](#); [ergodic theory](#)

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