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of Proposition 3.1. -- 3.1.2. The non-existence of a Khintchine like result -- 3.2. Full measure statements -- Chapter 4. Applications of Proposition 3.1 -- 4.1. Proof of Theorem 2.2 -- 4.1.1. Bernoulli convolutions -- 4.1.2. The {0,1,3} problem -- 4.2. Proof of Theorem 2.9 -- Chapter 5. A specific family of IFSs -- Chapter 6. Proof of Theorem 2.15 -- Chapter 7. Proof of Theorem 2.16 -- Chapter 8. Applications of the mass transference principle -- Chapter 9. Examples -- 9.1. IFSs satisfying the CS property -- 9.2. The non-existence of Khintchine like behaviour without exact overlaps -- Chapter 10. Final discussion and open problems -- Acknowledgments -- Bibliography -- Back Cover.

Sommario/riassunto

"In this paper we develop a new approach for studying overlapping iterated function systems. This approach is inspired by a famous result due to Khintchine from Diophantine approximation which shows that for a family of limsup sets, their Lebesgue measure is determined by the convergence or divergence of naturally occurring volume sums. For many parameterised families of overlapping iterated function systems, we prove that a typical member will exhibit similar Khintchine like behaviour. Families of iterated function systems that our results apply to include those arising from Bernoulli convolutions, the [numbers] problem, and affine contractions with varying translation parameter. As a by-product of our analysis we obtain new proofs of some well known results due to Solomyak on the absolute continuity of Bernoulli convolutions, and when the attractor in the [numbers] problem has positive Lebesgue measure. For each [equation] we let [phi]t be the iterated function system given by [equation]. We prove that either [phi]t contains an exact overlap, or we observe Khintchine like behaviour. Our analysis shows that by studying the metric properties of limsup sets, we can distinguish between the overlapping behaviour of iterated function systems in a way that is not available to us by simply studying properties of self-similar measures. Last of all, we introduce a property of an iterated function system that we call being consistently separated with respect to a measure. We prove that this property implies that the pushforward of the measure is absolutely continuous. We include several explicit examples of consistently separated iterated function systems"--