

“Amorphic complexity and tameness of constant length substitution shifts”

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Amorphic complexity is a relatively new invariant of topological dynamical systems useful in the study of aperiodic order and low complexity dynamics. Tameness is a well-studied notion of low complexity usually defined in terms of the size of the Ellis semigroup of the system. We study amorphic complexity and tameness in the class of automatic systems – systems arising from constant length substitutions. We provide a closed formula for the amorphic complexity of any minimal automatic system and show that tameness of such systems can be succinctly characterized through amorphic complexity: A minimal automatic system is tame if and only if its amorphic complexity is zero (in which case the system is finite) or one. Our proofs use methods from fractal geometry and introduce some new dynamically-defined pseudometrics. These methods seem suitable for study of nonminimal automatic systems as well as other systems of S-adic nature. Time permitting we will touch on some possible generalisations in these directions.