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Boundary actions of free semigroups

We consider the natural action of a free, finitely generated semigroup (the set of all finite words in a finite alphabet S) on its boundary (the space of infinite words in S) by concatenation. While boundary actions of free groups are well-studied, much less is known for semigroups. In joint work with Anush Tserunyan, we completely characterize those Markov measures which make the boundary action weakly mixing (i.e., the product with an ergodic probability measure preserving action is ergodic). This is an ingredient in the proof of pointwise ergodic theorems for measure preserving actions of free semigroups.